Morrison

DINOSAURS!

•DISCOVER THE GIANTS OF THE PRE RIC WORLD•

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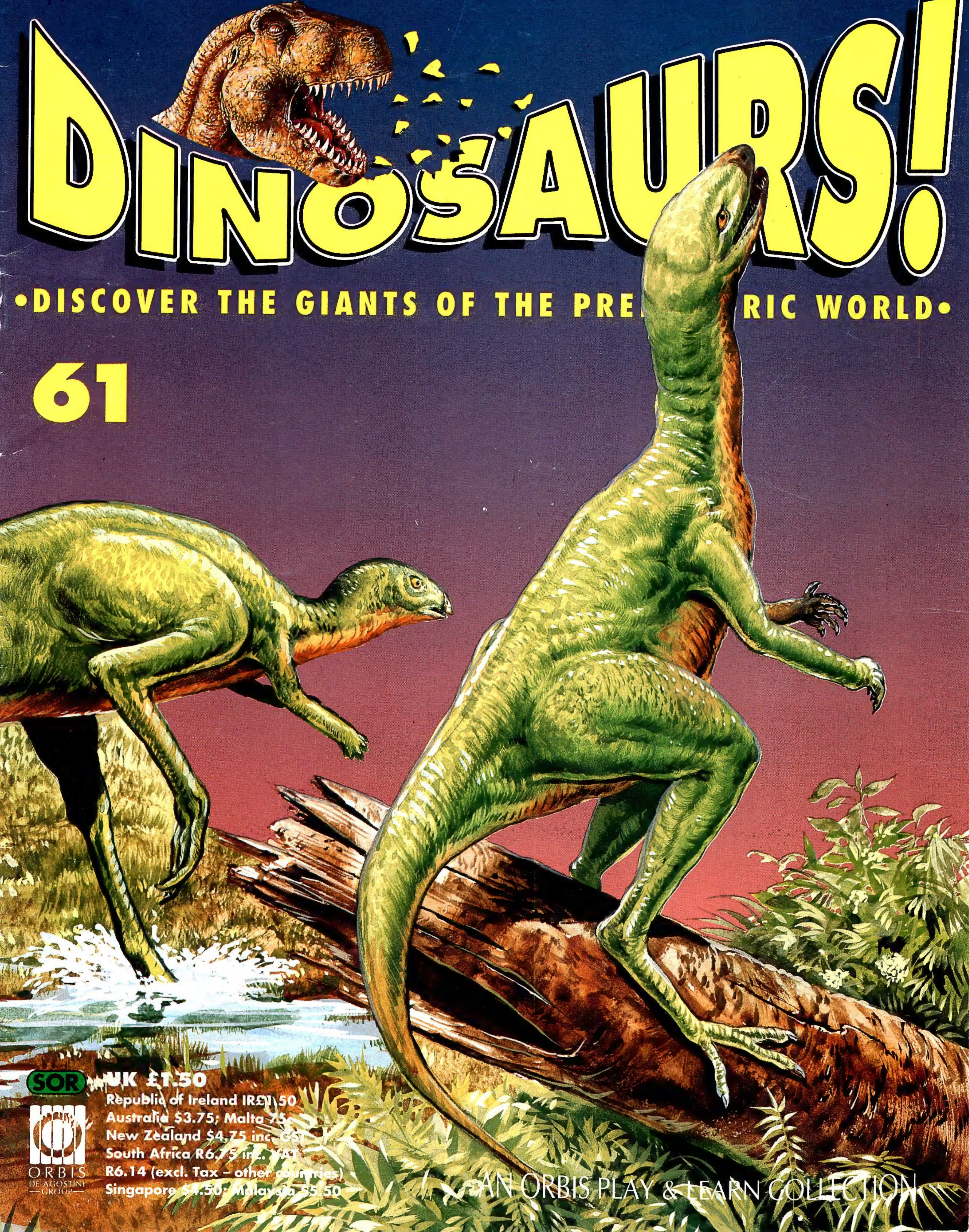

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PARKSOSAURUS

***Parksosaurus* was one of the best sprinters in the dinosaur world.**

Parksosaurus was one of the last survivors of a family of agile little dinosaurs called hypsilophodontidae. This family included *Hypsilophodon* and *Leaellynasaura*. Built to run fast, these two-legged dinosaurs have been found all over the world and are often compared to the elegant gazelles of today. *Parksosaurus* lived about 50 million years later than *Hypsilophodon* and was found in the dinosaur-rich rocks of Alberta, Canada.

LIVING WITH GIANTS

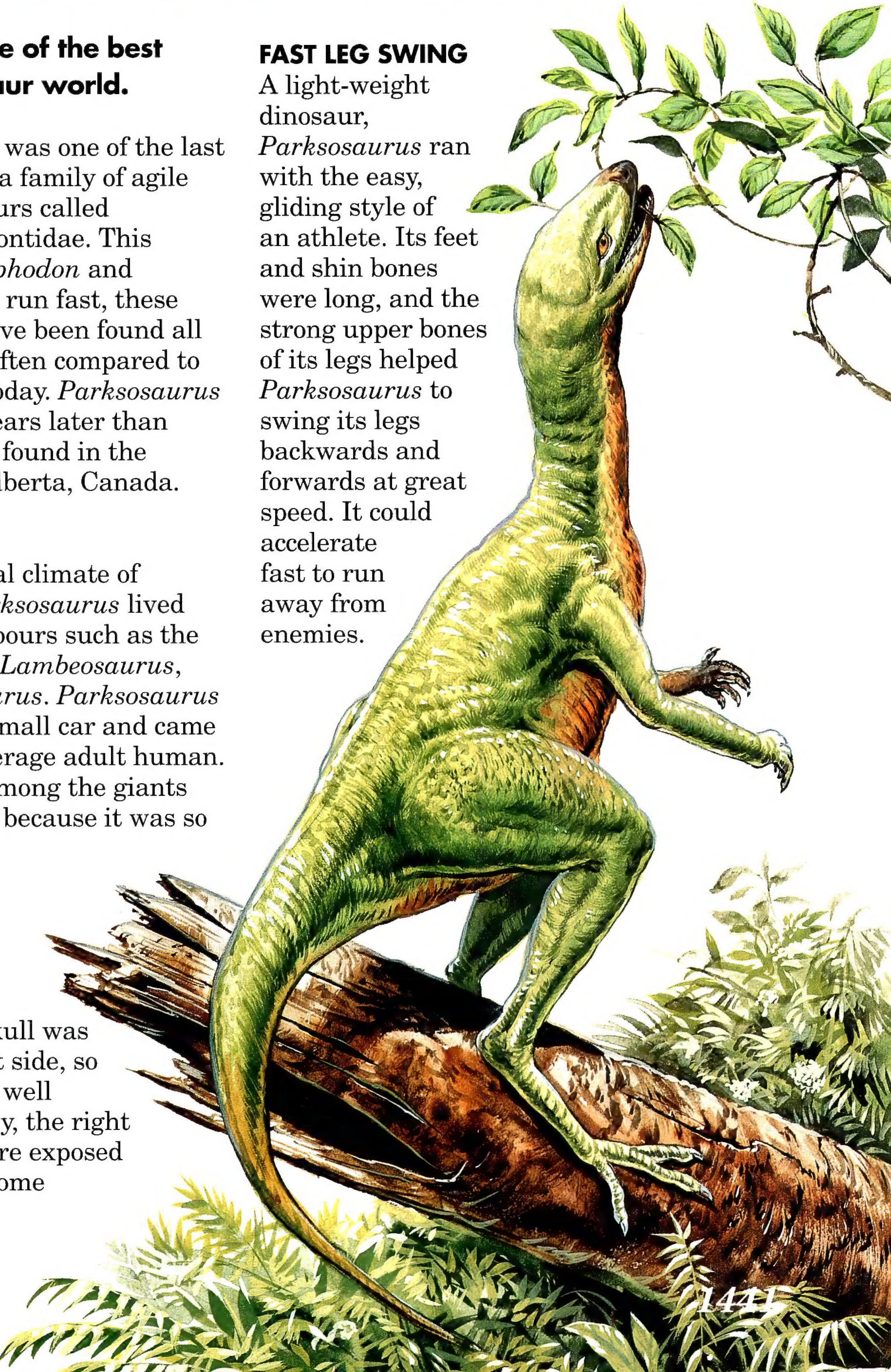
In the warm, sub-tropical climate of Cretaceous Canada, *Parksosaurus* lived with much larger neighbours such as the plant-eating hadrosaur, *Lambeosaurus*, and ferocious *Albertosaurus*. *Parksosaurus* was about as long as a small car and came up to the waist of an average adult human. It managed to survive among the giants that shared its territory because it was so agile and fast-moving.

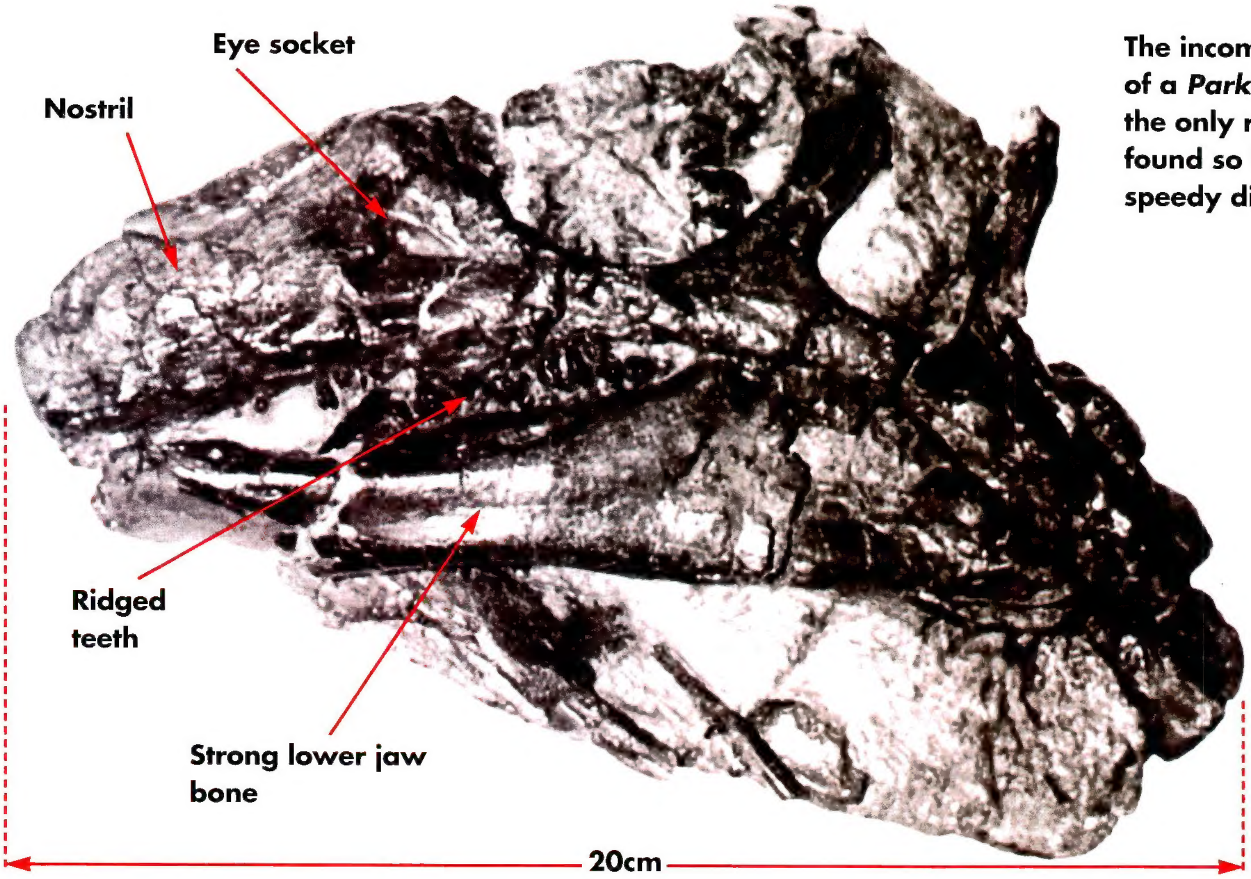
HALF A HEAD

When it was found, all that remained of *Parksosaurus* was an incomplete skull. The skull was buried in sand on its left side, so that part of it was quite well preserved. Unfortunately, the right side of the skull was more exposed and these parts had become damaged and broken.

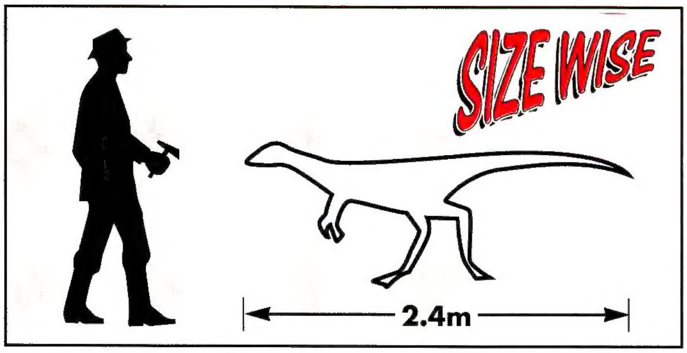
FAST LEG SWING

A light-weight dinosaur, *Parksosaurus* ran with the easy, gliding style of an athlete. Its feet and shin bones were long, and the strong upper bones of its legs helped *Parksosaurus* to swing its legs backwards and forwards at great speed. It could accelerate fast to run away from enemies.





The incomplete skull of a *Parksosaurus*, the only remains found so far of this speedy dinosaur.



MONSTER FACTS

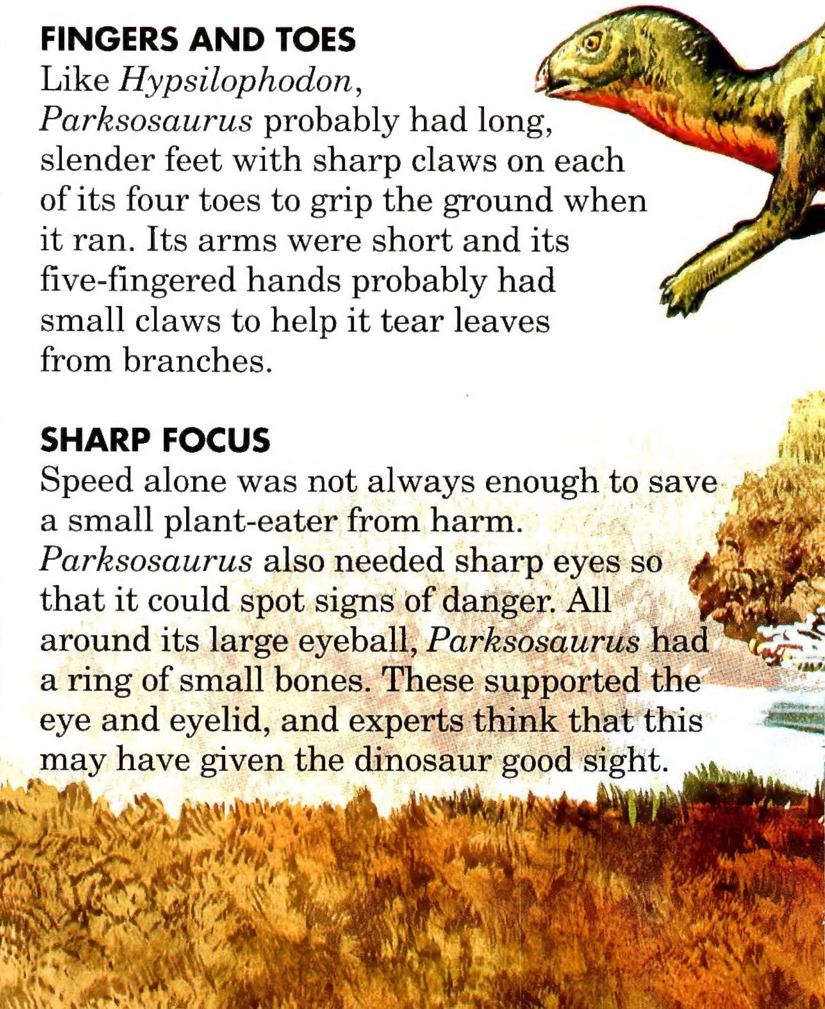
- **NAME:** *Parksosaurus* (parx-oh-saw-rus) is named after a Canadian palaeontologist, William Parks.
- **GROUP:** dinosaur
- **SIZE:** 2.4m long
- **FOOD:** plants
- **LIVED:** about 70 million years ago in the Late Cretaceous Period in Alberta, Canada

FINGERS AND TOES

Like *Hypsilophodon*, *Parksosaurus* probably had long, slender feet with sharp claws on each of its four toes to grip the ground when it ran. Its arms were short and its five-fingered hands probably had small claws to help it tear leaves from branches.

SHARP FOCUS

Speed alone was not always enough to save a small plant-eater from harm. *Parksosaurus* also needed sharp eyes so that it could spot signs of danger. All around its large eyeball, *Parksosaurus* had a ring of small bones. These supported the eye and eyelid, and experts think that this may have given the dinosaur good sight.



WELL CHEWED

Chewing food slowly and thoroughly helps break it down and this helps to prevent stomach ache! *Parksosaurus* developed a good system of chewing. It had strong jaw muscles and cheeks. As it munched plants and leaves, they were crushed by an overlapping line of ridged teeth at the sides of its mouth.

BACK AND FORTH

The food was constantly pushed back on to the teeth by the dinosaur's pouch-like cheeks so it could be chewed over and over again. Only when it was ground to a pulp was the food finally digested in the stomach.

Is it true that hypsilophodonts lived on Earth longer than any other ornithopod dinosaurs?

Yes. Hypsilophodonts lived from the middle of the Jurassic Period to the end of the Cretaceous, spanning some 100 million years. These successful, agile plant-eaters have been found in Asia, Antarctica, Australia and Europe.

Although *Parksosaurus* was much smaller than many other dinosaurs, it managed to survive successfully because of its speed and agility.

NOTHOSAURUS

Even the most slippery fish were not safe from the sharp teeth of *Nothosaurus*.

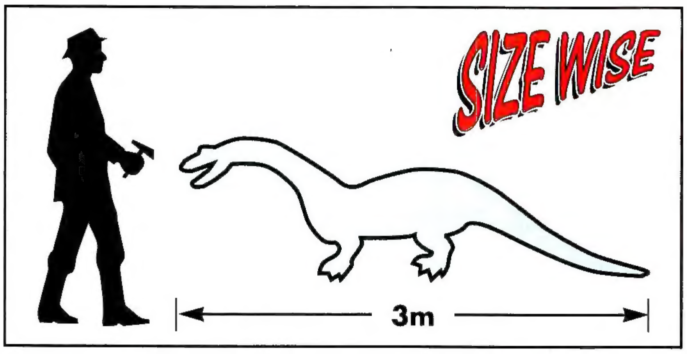
Nothosaurus swam in Triassic seas alongside the early ichthyosaurs, but they did not have such streamlined bodies. *Nothosaurus* had wide, flat limbs that it probably used to drive its body through the water in a sort of doggy-paddle style.

DASH AND GRAB

Nothosaurus had long, sharp teeth. The reptile would snatch a fish in its jaws, piercing through the flesh. The helpless fish was held in the secure grasp of these interlocking jaws until the struggle was over and *Nothosaurus* swallowed its supper.

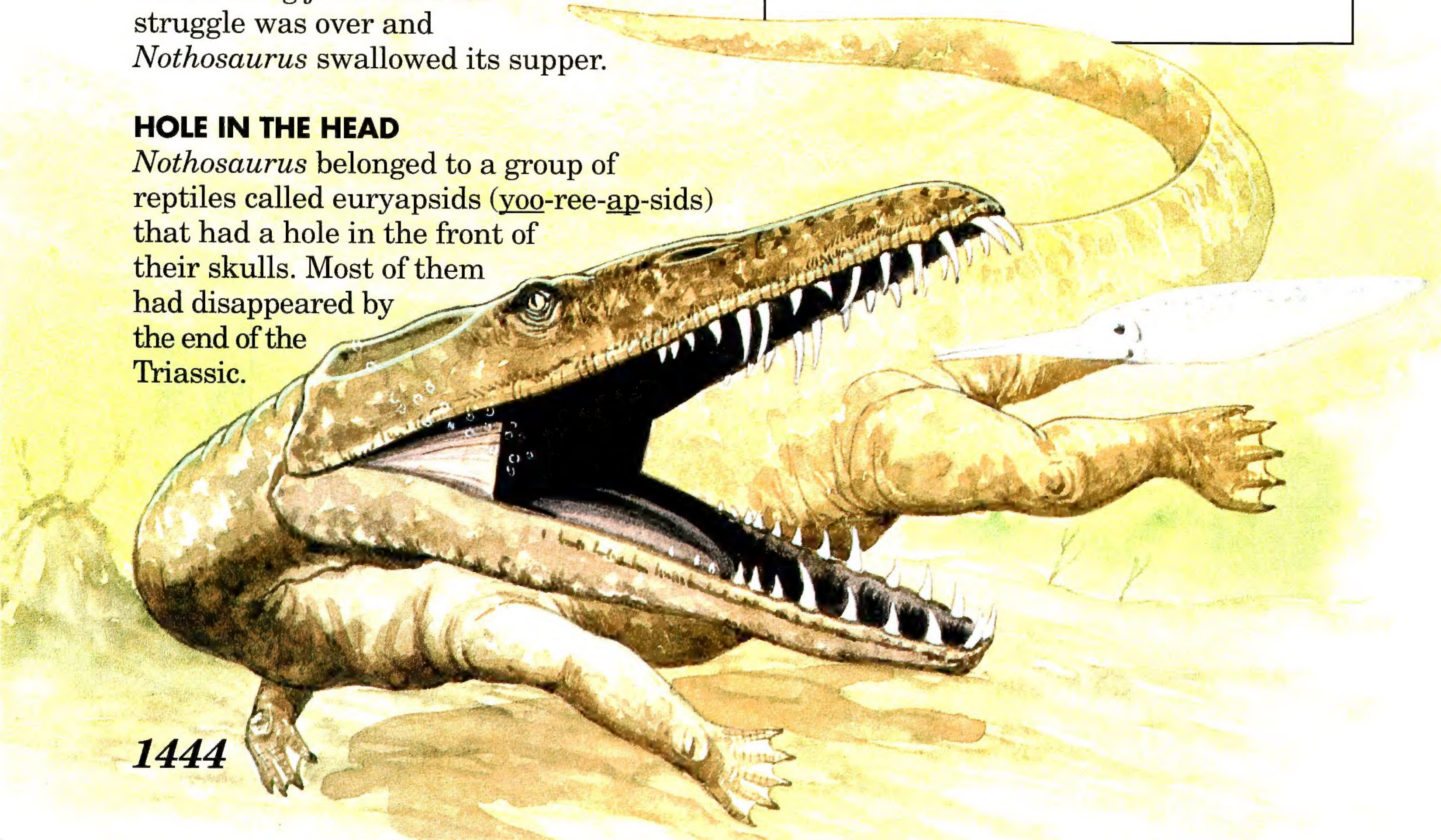
HOLE IN THE HEAD

Nothosaurus belonged to a group of reptiles called euryapsids (yoo-ree-ap-sids) that had a hole in the front of their skulls. Most of them had disappeared by the end of the Triassic.



MONSTER FACTS

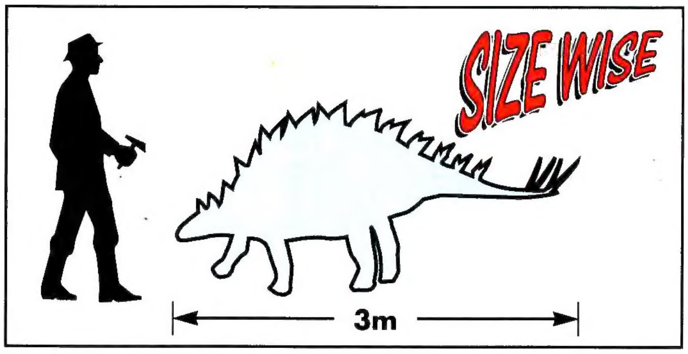
- **NAME:** *Nothosaurus* (no-thoh-saw-rus) means 'spurious reptile'
- **GROUP:** reptile
- **SIZE:** up to 3m long
- **FOOD:** fish and sea creatures
- **LIVED:** about 215 million years ago in Mid-Triassic Germany and South Africa



DRAVIDOSAURUS

***Dravidosaurus* is the only stegosaur known to have lived in India.**

Dravidosaurus lived millions of years after its stegosaur relatives roamed the Earth. The African stegosaur, *Kentrosaurus,* lived in the Jurassic Period more than 70 million years before *Dravidosaurus* appeared. The Indian dinosaur seems to have been the last of the stegosaurs.



MONSTER FACTS

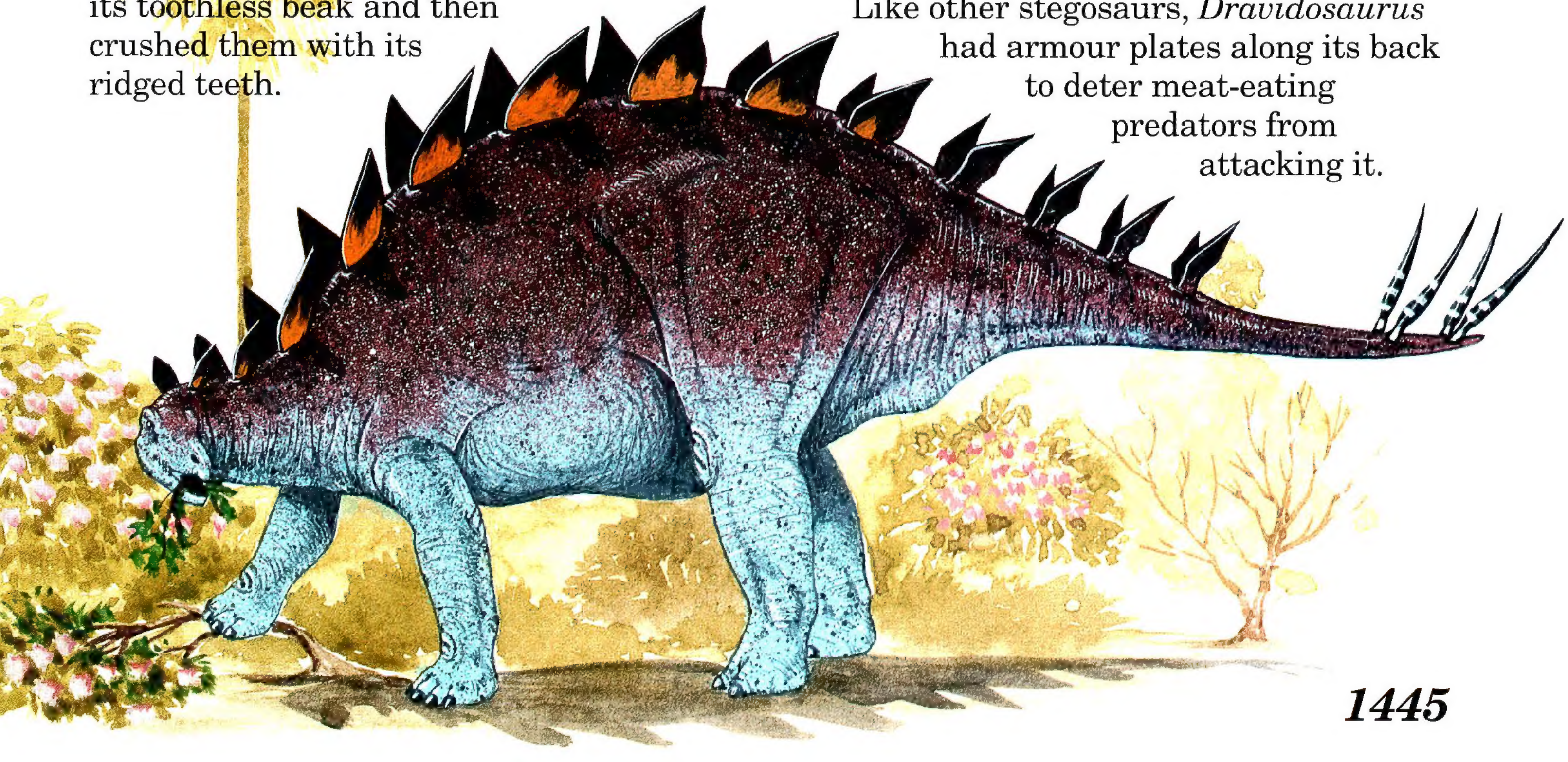
- **NAME:** *Dravidosaurus* (dra-vid-oh-saw-rus) means 'reptile from southern India'
- **GROUP:** dinosaur
- **SIZE:** up to 3m long
- **FOOD:** plants
- **LIVED:** about 65 million years ago in the Late Cretaceous Period in southern India

NIP AND MUNCH

Dravidosaurus was named in 1979 from the remains of a skull but other fossils have been found since then. It was about as long as a small car with a tiny, low-slung head. As it ambled along on four short, sturdy legs, *Dravidosaurus* stooped to munch at plants and shoots that grew within its reach. It nipped off leaves with its toothless beak and then crushed them with its ridged teeth.

KEEP OFF

Like other stegosaurs, *Dravidosaurus* had armour plates along its back to deter meat-eating predators from attacking it.



Giants and thunder

Millions of years ago, giant mammals, relatives of today's rhinos, hippos and tapirs, thundered across the land.

Elephants are big! Have you seen a live one? A big male is the largest living land animal. It weighs 6 tonnes and stands 3.5m tall at the shoulder. But if you had been in Asia about 30 million years ago, you might have seen the biggest land mammal that ever lived; it was called *Indricotherium*.

BIGGER THAN BIG?

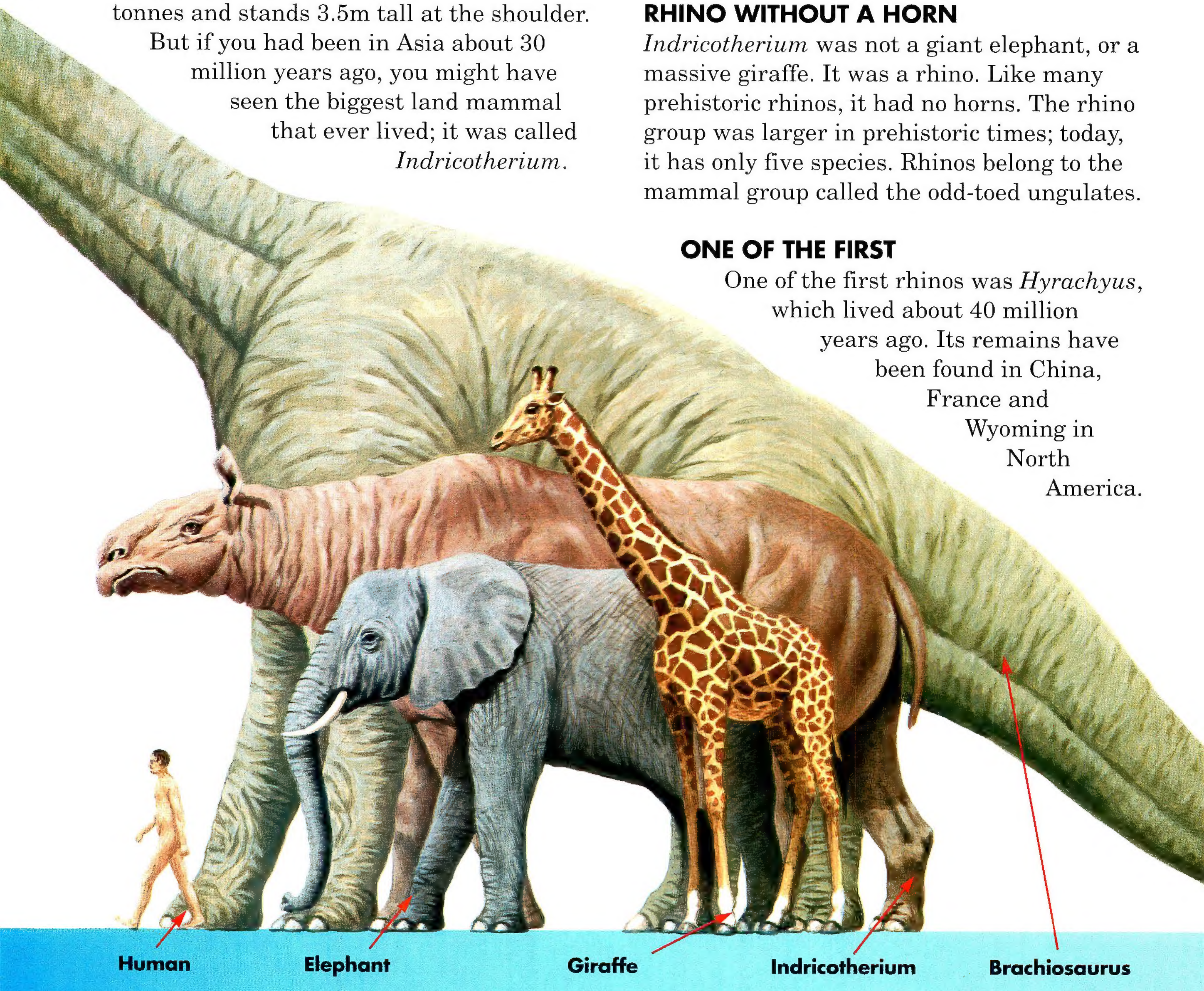
Indricotherium was more than 8m long, and weighed up to 20 tonnes. It was 5.5m high at the shoulder. Its massive body was supported on four pillar-like legs. With its long, thick neck, it could stretch up to eat leaves nearly 8m above the ground!

RHINO WITHOUT A HORN

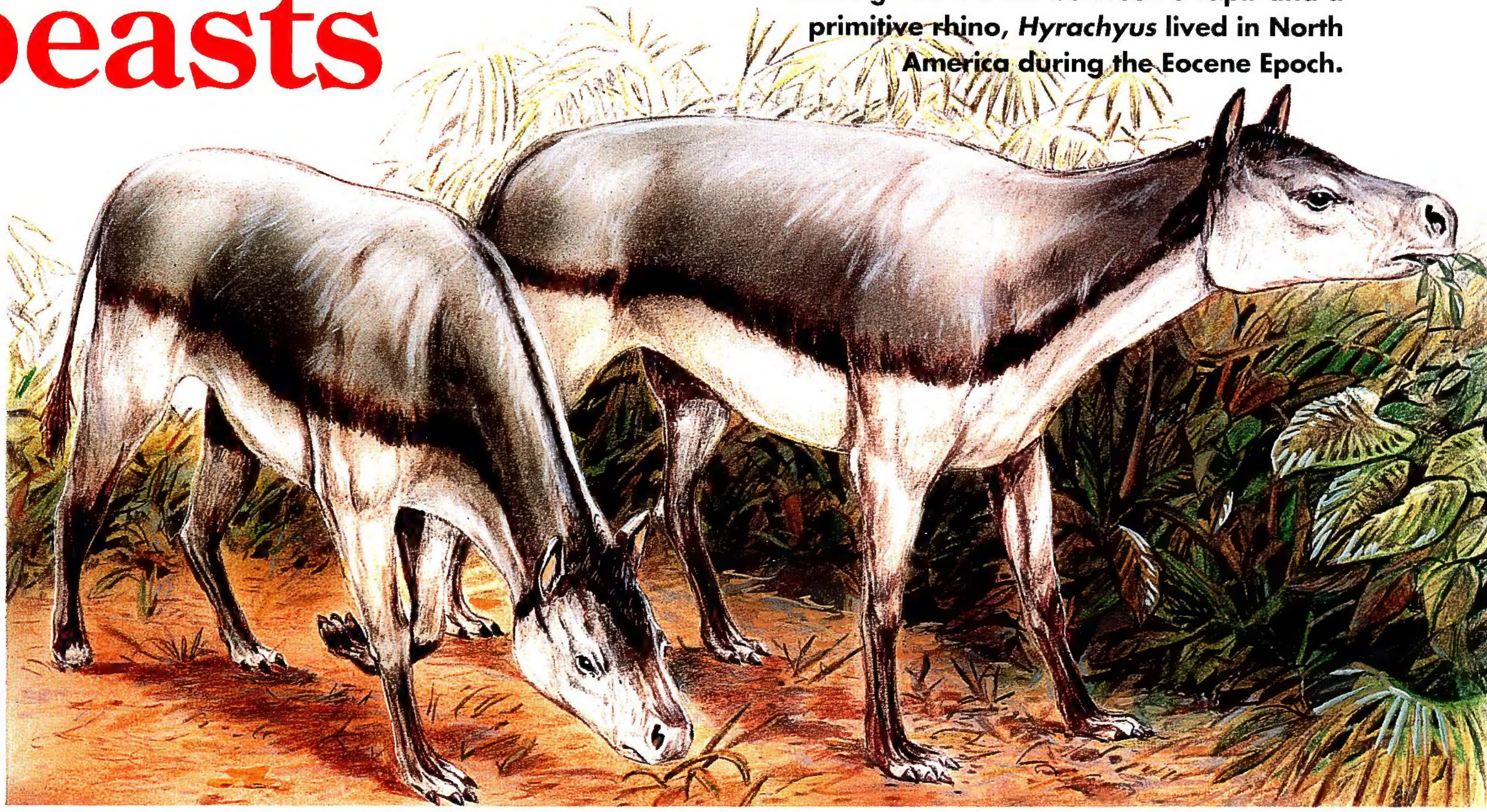
Indricotherium was not a giant elephant, or a massive giraffe. It was a rhino. Like many prehistoric rhinos, it had no horns. The rhino group was larger in prehistoric times; today, it has only five species. Rhinos belong to the mammal group called the odd-toed ungulates.

ONE OF THE FIRST

One of the first rhinos was *Hyrachyus*, which lived about 40 million years ago. Its remains have been found in China, France and Wyoming in North America.



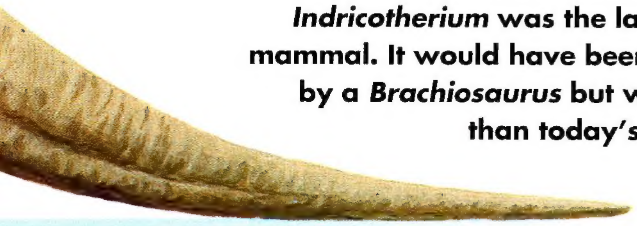
beasts



Looking like a cross between a tapir and a primitive rhino, *Hyrachyus* lived in North America during the Eocene Epoch.

RHINOS GALORE

Hyrachyus had three small hoofs on each foot, and was about the size of a pig. In fact, it was very similar to the pig-like tapirs, another group of odd-toed ungulates. Some prehistoric rhinos looked more like hippos. One was *Teleoceras*. It lived 10 million years ago in central North America. It had a barrel-shaped body and stumpy legs, and was 4m long. Some prehistoric rhinos had nose horns; one was *Elasmotherium*. It roamed Europe and Asia about a million years ago. It was the size of an elephant with a horn on its nose that measured up to 2m long!

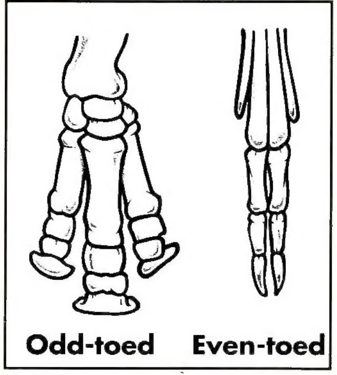


***Indricotherium* was the largest land mammal. It would have been dwarfed by a *Brachiosaurus* but was bigger than today's elephant.**

What is? AN ODD-TOED UNGULATE

Ungulates are mammals with hoofs on their feet, instead of claws or nails. There are two main groups today:

- Odd-toed ungulates. On each foot they have three hoofs, like rhinos and tapirs. Or one hoof per foot, like horses and zebras.
- Even-toed ungulates. On each foot they have four or two hoofs. This group includes camels, pigs, hippos, giraffes, deer, antelope, sheep, goats and cattle.

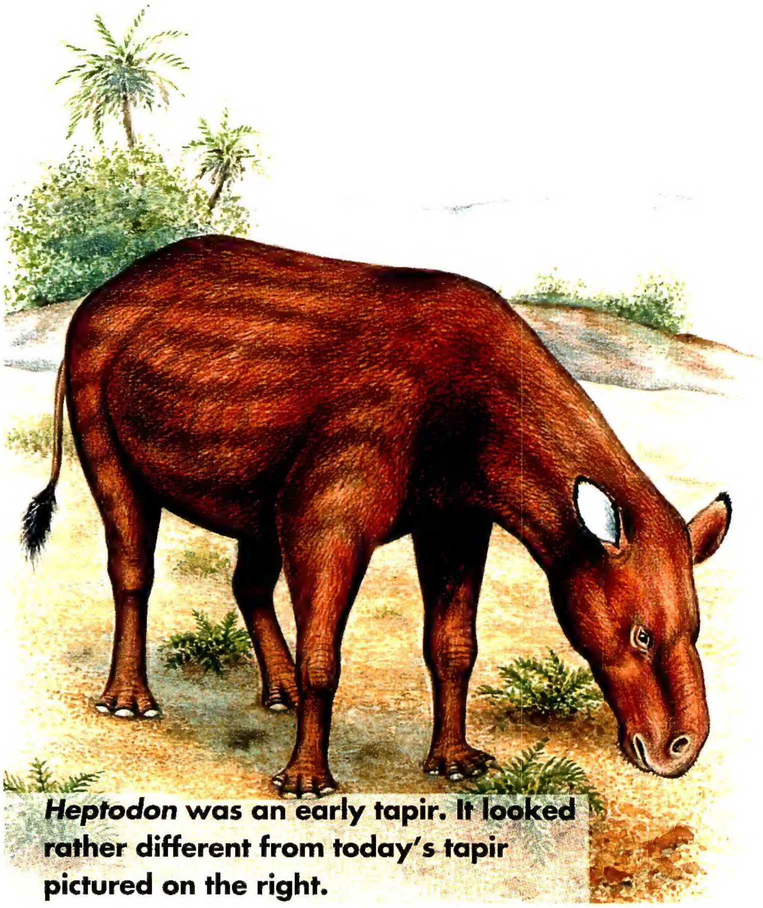


PIGS OF THE FOREST

Tapirs are pig-shaped, odd-toed ungulates. They live in the forests of Central and South America and South-East Asia. There are four species living today. But, like rhinos, there were many more tapirs in prehistoric times.

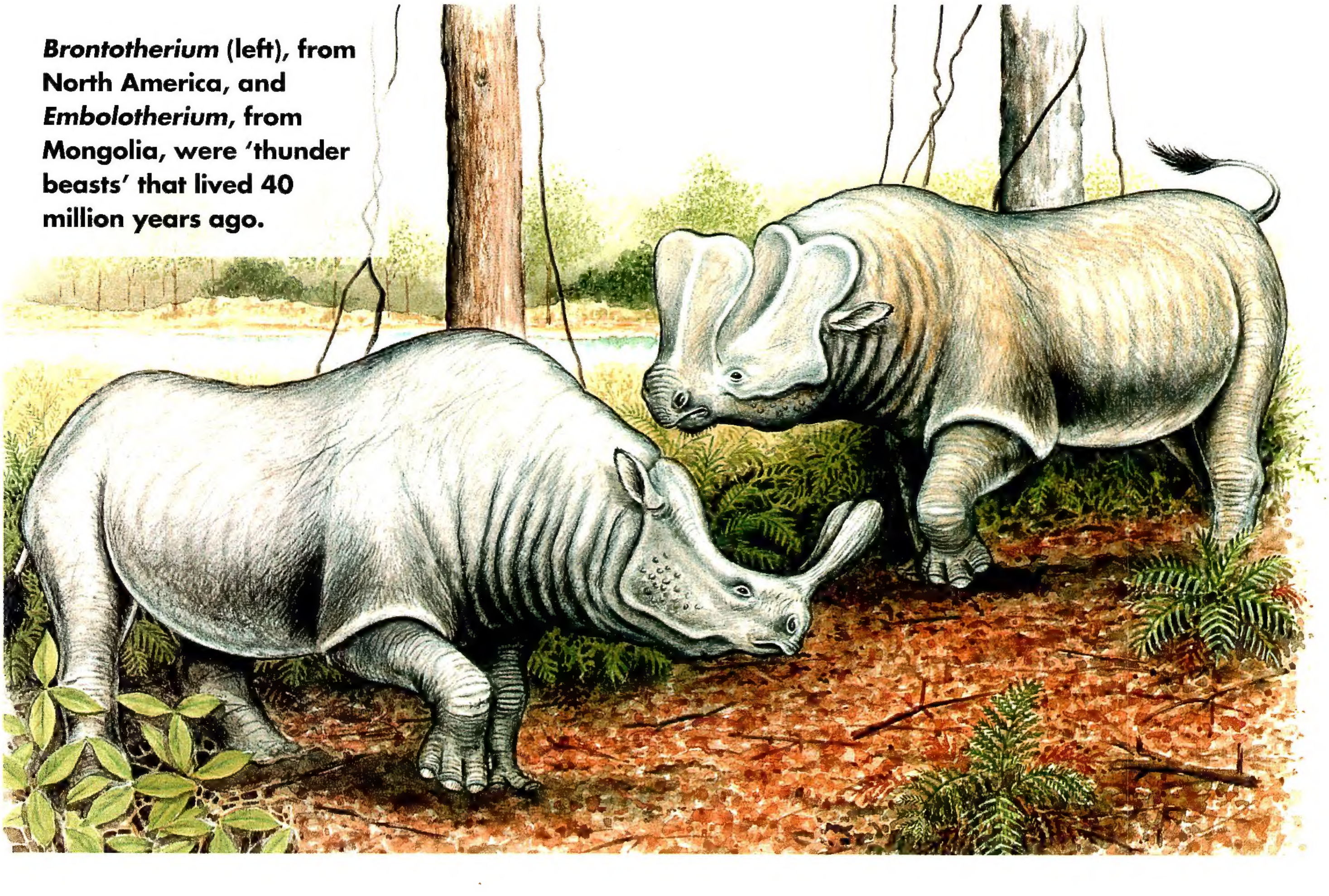
THE TAPIR'S 'TRUNK'

Heptodon was a small, early tapir that lived 50 million years ago in North America. Later on there was *Helaletes* which lived about 40 million years ago. This tapir had the beginnings of a long, fleshy snout, like a small elephant trunk, which tapirs still have today. A tapir uses it for sniffing and probing, and pulling food into its mouth. *Miotapirus*, another tapir from North America, lived 20 million years ago. The tapir group is one of the most ancient of mammal groups.



Heptodon **was an early tapir. It looked rather different from today's tapir pictured on the right.**

Brontotherium **(left), from North America, and** ***Embolotherium*****, from Mongolia, were 'thunder beasts' that lived 40 million years ago.**



BIG-NOSED 'THUNDER BEASTS'

The rhinos and tapirs had some really weird odd-toed cousins, the brontotheres ('thunder beasts') and the chalicotheres. These were massive-bodied plant-eaters, too. But they have all died out.

MASSIVE LUMBERERS

One of the first big brontotheres, which lived 40 million years ago, was *Brontops*. It was about the size of today's female elephant. It had two odd horns on its nose. These 'horns' were growths of bone covered by thick skin. Later came *Embolotherium* of Mongolia, and *Brontotherium* of North America – both massive beasts 2.5m high.

Is it true that chalicotheres still survive today?

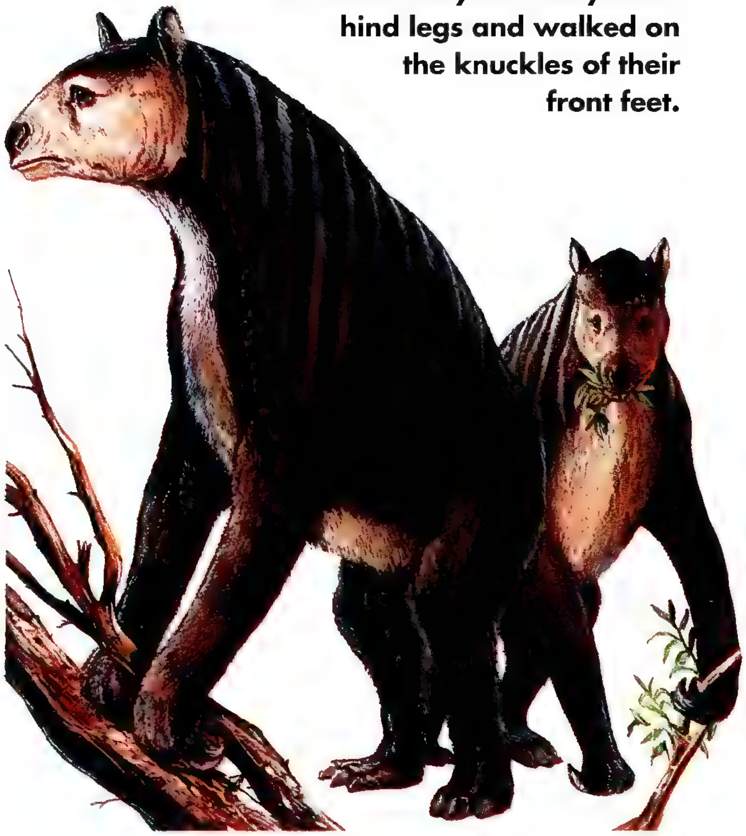
Er ... possibly. There are stories from the icy wastes of Siberia of huge, horse-like creatures with long front legs and big claws. They are pictured on stone tombs from over 2,000 years ago, and there are still many rumours today. There are also tales of a creature, very like chalicotheres, that lives in the dense forests of Africa. It is called the 'nandi bear'. But, like the Loch Ness Monster, in Scotland, the existence of such animals is probably wishful thinking rather than serious science.

BATTLING AND DEFENDING

Why did some rhinos and brontotheres have such huge, strange nose-horns? Perhaps they were used for defence against attacking meat-eaters of their time, such as the creodonts. Or perhaps the horns were a sign of size and strength. These animals charged and pushed and battled with rivals of their own kind to become leaders of the herd, or to win mates at breeding time.

HOOFS TO CLAWS

A close relation to *Embolotherium* and *Brontotherium* was the 3m-long chalicothere *Moropus*, from 15 million years ago. Its fossils come from North America. *Moropus* had a long neck and front legs, and a body that sloped down at the back. Its hoofs had become shaped like claws. It may have walked on the soles of its feet, or on its curled-over knuckles, like a gorilla!



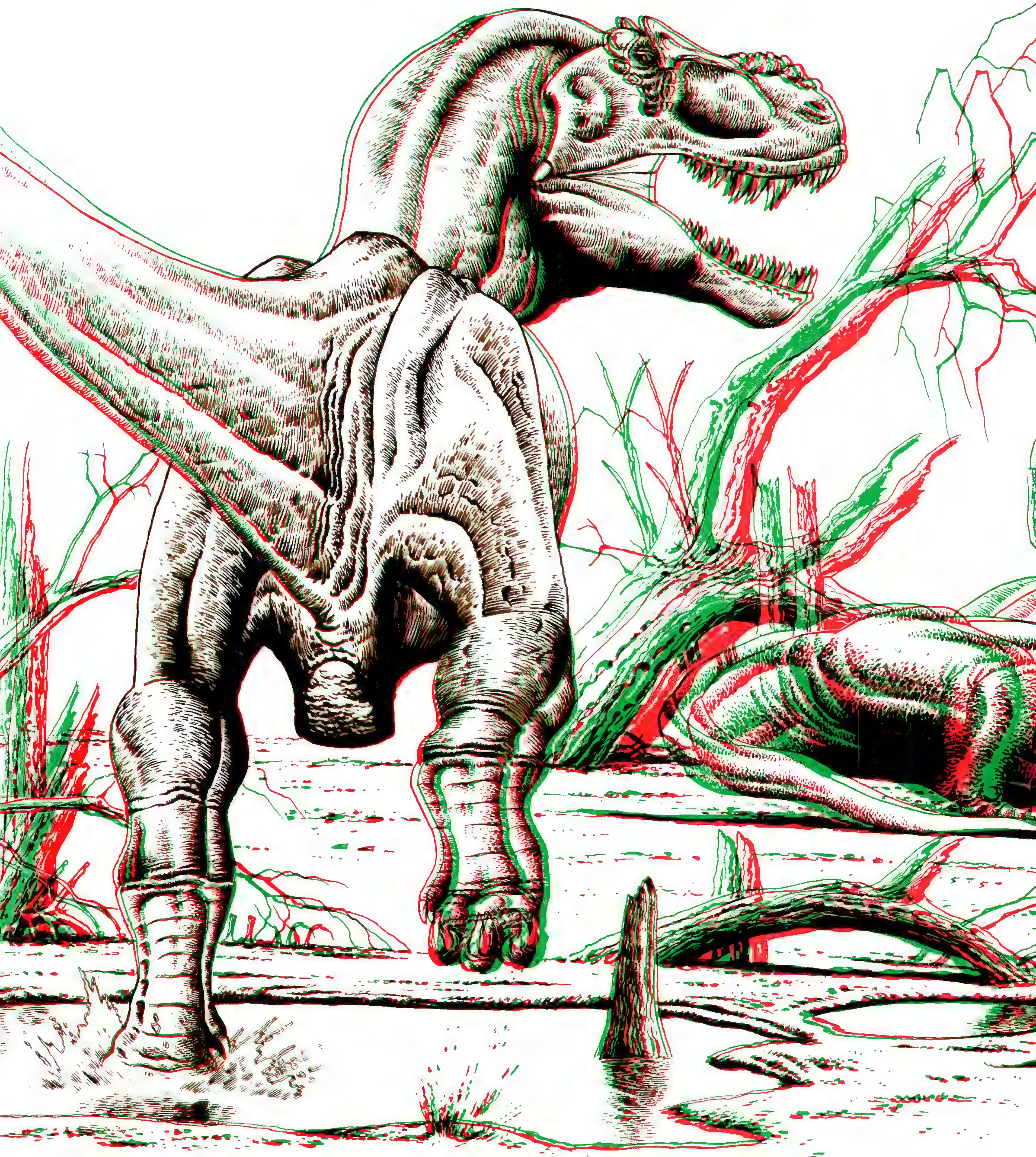
The chalicotheres were strange browsers. They had very short hind legs and walked on the knuckles of their front feet.

GIANTS OF THE PAST

A small herd of *Parksosaurus* flees in panic across the sub-tropical landscape of Late Cretaceous Canada. Will their natural speed and agility enable them to escape from the large and hungry *Albertosaurus* that has surprised them as they feed? Or will one of the small plant-eaters meet its doom today?

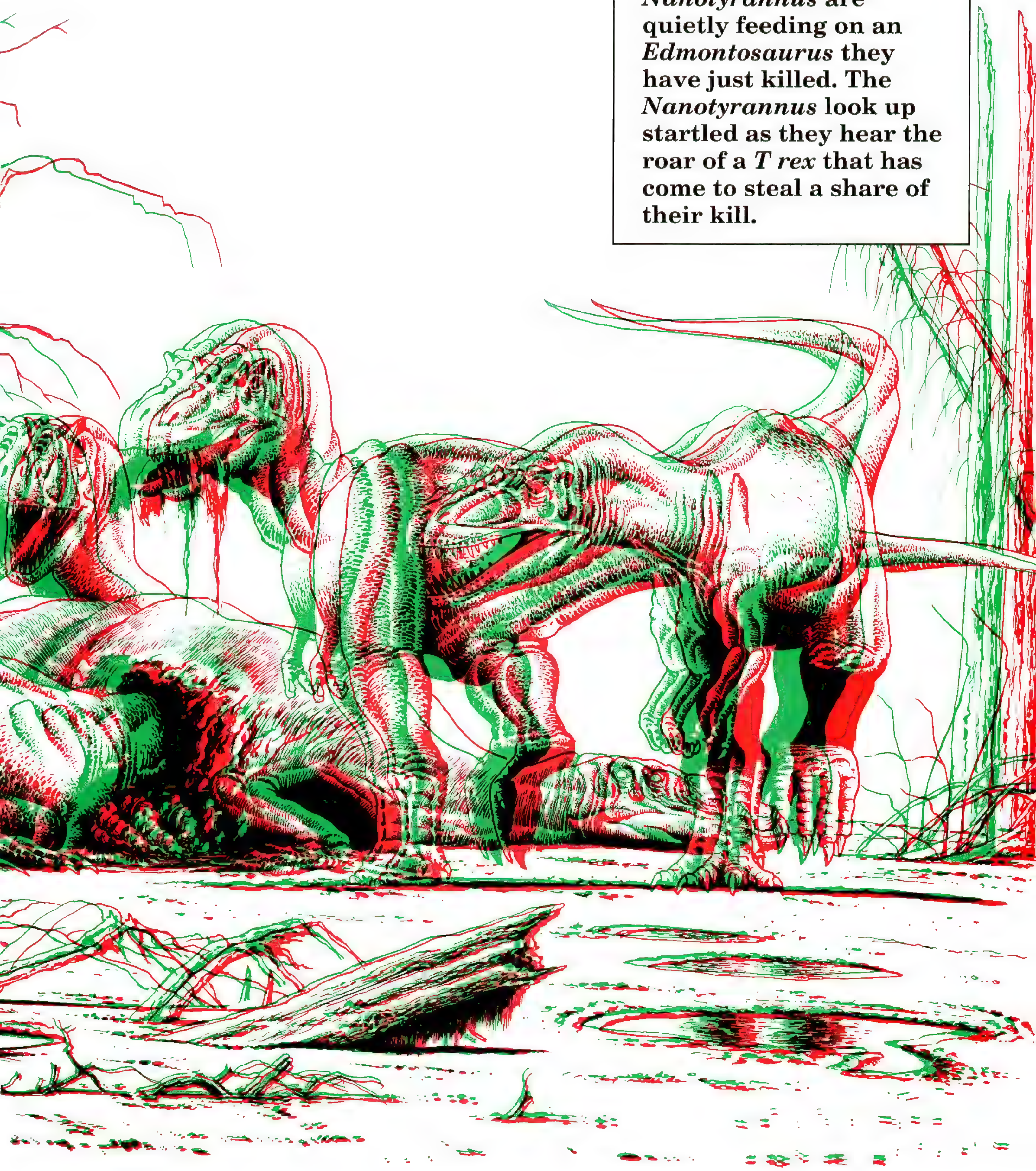
PARKSOSAURUS

3-D Gallery



NANOTYRANNUS

On the mud flats in Montana during the Late Cretaceous, some *Nanotyrannus* are quietly feeding on an *Edmontosaurus* they have just killed. The *Nanotyrannus* look up startled as they hear the roar of a *T rex* that has come to steal a share of their kill.



Ambush!

How did prehistoric animals hunt for their food?

When we are hungry it is easy to find food. We can buy a hamburger, or some fish and chips. But suppose we were wild animals having to hunt for our food, which was usually trying to run away? Meat-eating animals have survived up to now because they have evolved a number of different ways to catch the food they need.

BY SURPRISE

Ambush is one of these ways. It takes great patience, but not a great deal of energy. The hunting animal first lies hidden, then it leaps out on its victim, catching it by surprise. The cats, like lions, lynxes, and even the domestic tabby, are great masters of this type of hunting.

A FROZEN CLUE

The lions and their relatives hunted by ambush in ancient times too. In 1979, gold miners found the 36,000-year-old mummified body of an extinct bison in the frozen ground of Alaska.

CLUES IN THE ICE

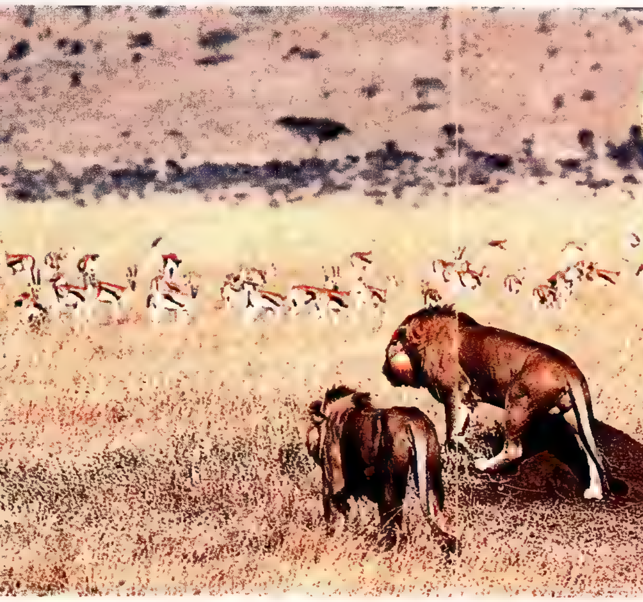
The bison was partially eaten and the nostrils had been crushed. Lions had done this. The lions had lain in wait for the bison herd to come by, and pounced.

TOO HEAVY

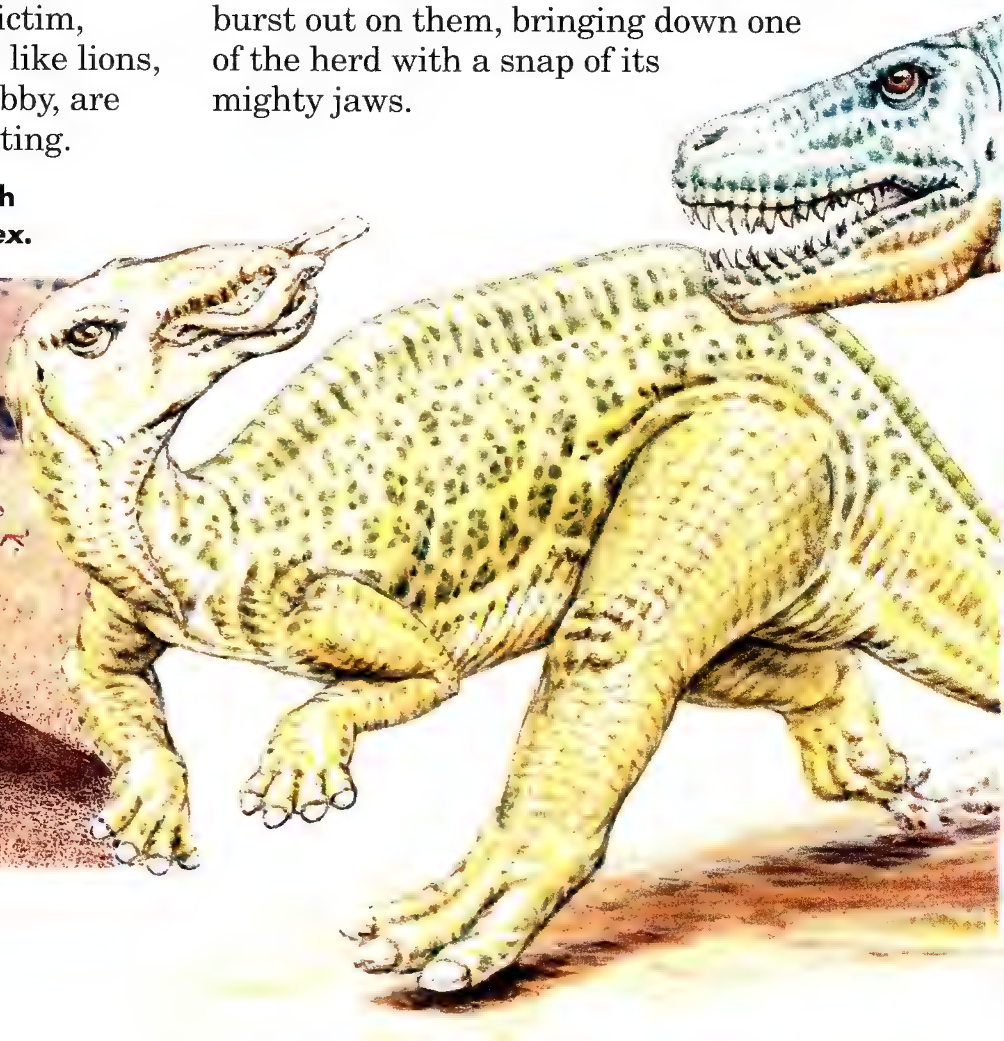
Some of the big dinosaurs hunted by using the ambush technique too. *Tyrannosaurus* was probably too big and heavy to do much chasing about.

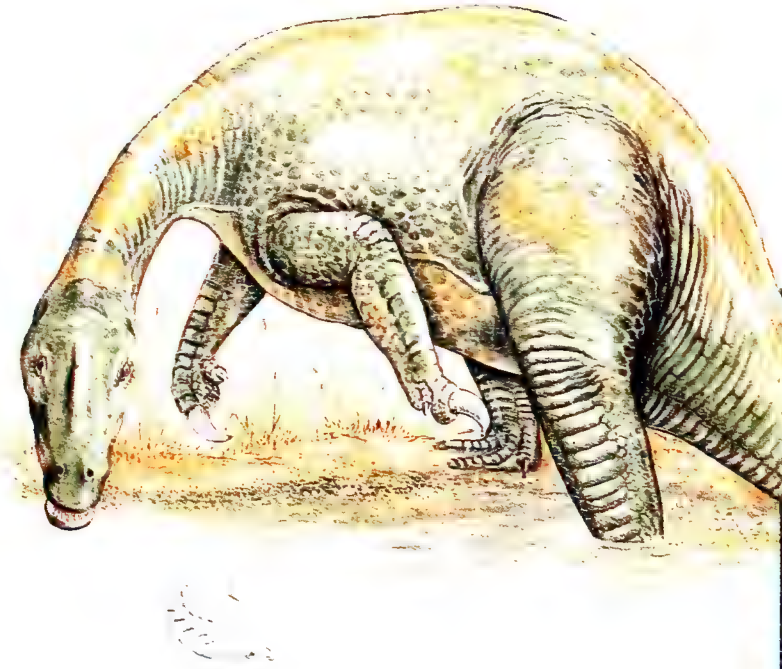
TYRANNOSAURUS KILL

T rex probably laid in wait in thickets for duckbilled dinosaurs to pass by. Then it burst out on them, bringing down one of the herd with a snap of its mighty jaws.



Modern lions in the Serengeti ambush their victims by surprise, just like *T rex*.

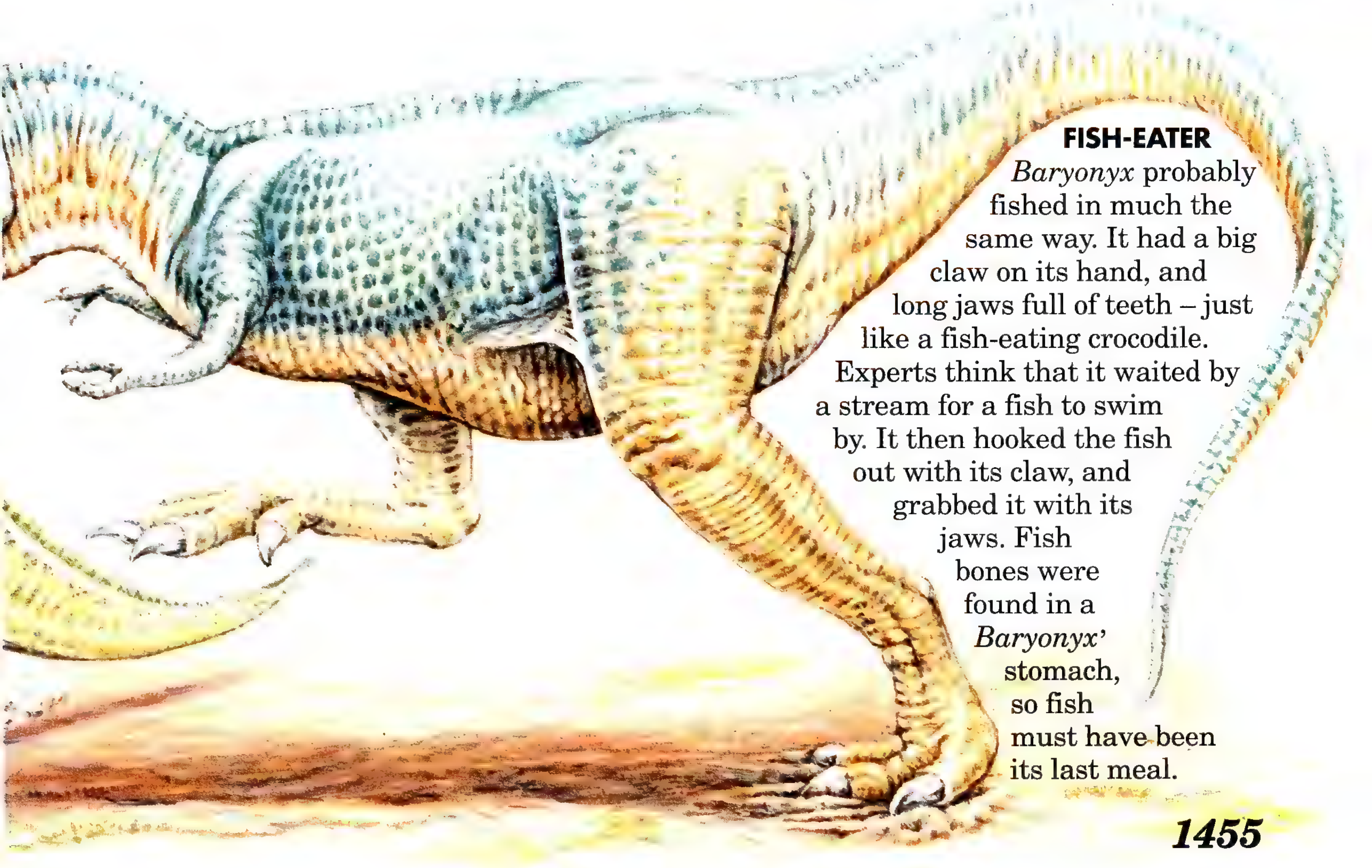




In the same way as today's fisherman, *Baryonyx* used to wait patiently for a suitable fish to catch.

COME FISHING

Watch someone fishing. He hunts in the same way, standing motionless until a fish comes close enough to be hooked and trapped.



FISH-EATER

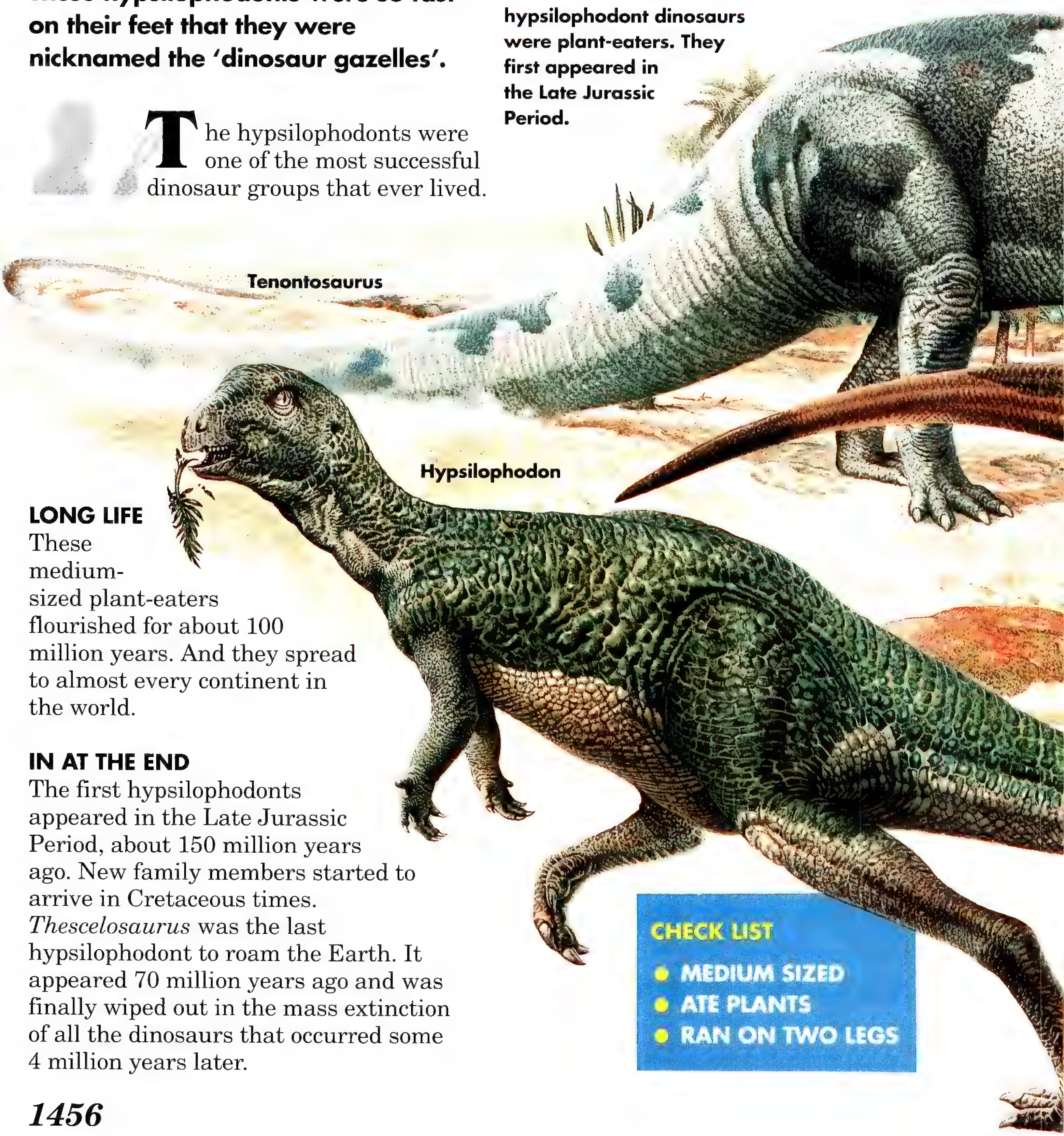
Baryonyx probably fished in much the same way. It had a big claw on its hand, and long jaws full of teeth – just like a fish-eating crocodile. Experts think that it waited by a stream for a fish to swim by. It then hooked the fish out with its claw, and grabbed it with its jaws. Fish bones were found in a *Baryonyx*' stomach, so fish must have been its last meal.

‘Dinosaur gazelles’

These hypsilophodonts were so fast on their feet that they were nicknamed the ‘dinosaur gazelles’.

The hypsilophodonts were one of the most successful dinosaur groups that ever lived.

These three successful hypsilophodont dinosaurs were plant-eaters. They first appeared in the Late Jurassic Period.



LONG LIFE

These medium-sized plant-eaters flourished for about 100 million years. And they spread to almost every continent in the world.

IN AT THE END

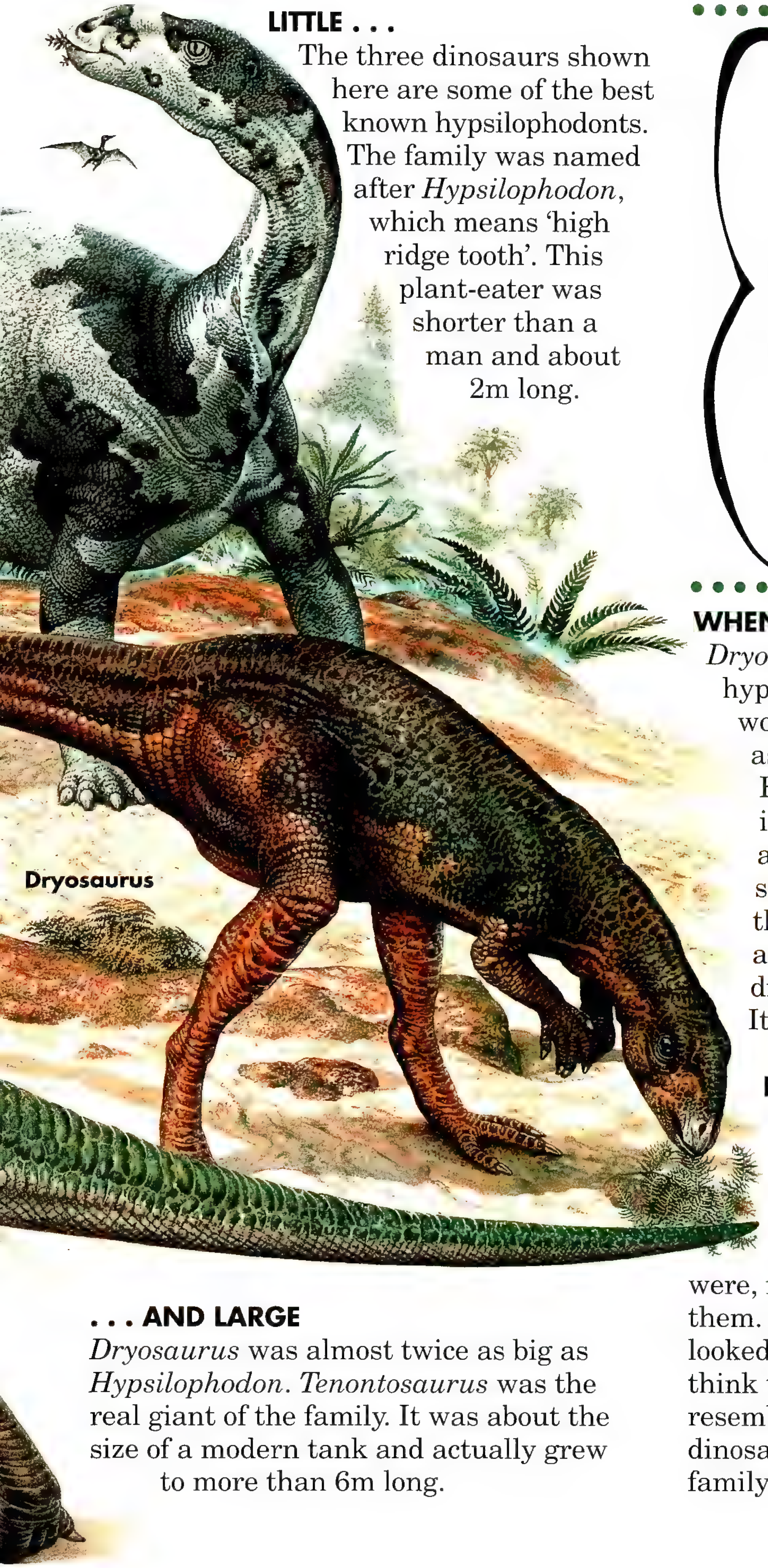
The first hypsilophodonts appeared in the Late Jurassic Period, about 150 million years ago. New family members started to arrive in Cretaceous times. *Thescelosaurus* was the last hypsilophodont to roam the Earth. It appeared 70 million years ago and was finally wiped out in the mass extinction of all the dinosaurs that occurred some 4 million years later.

CHECK LIST

- MEDIUM SIZED
- ATE PLANTS
- RAN ON TWO LEGS

LITTLE . . .

The three dinosaurs shown here are some of the best known hypsilophodonts. The family was named after *Hypsilophodon*, which means 'high ridge tooth'. This plant-eater was shorter than a man and about 2m long.



. . . AND LARGE

Dryosaurus was almost twice as big as *Hypsilophodon*. *Tenontosaurus* was the real giant of the family. It was about the size of a modern tank and actually grew to more than 6m long.

IT'S A FACT

ONE AND THE SAME

Scientists now know *Dryosaurus* ranged almost worldwide. But they were not always so sure. When fossil remains were first found in North America and East Africa they were given different names. It was only when experts compared the two discoveries that they realised they were identical. They called them both *Dryosaurus*.

WHEN AND WHERE

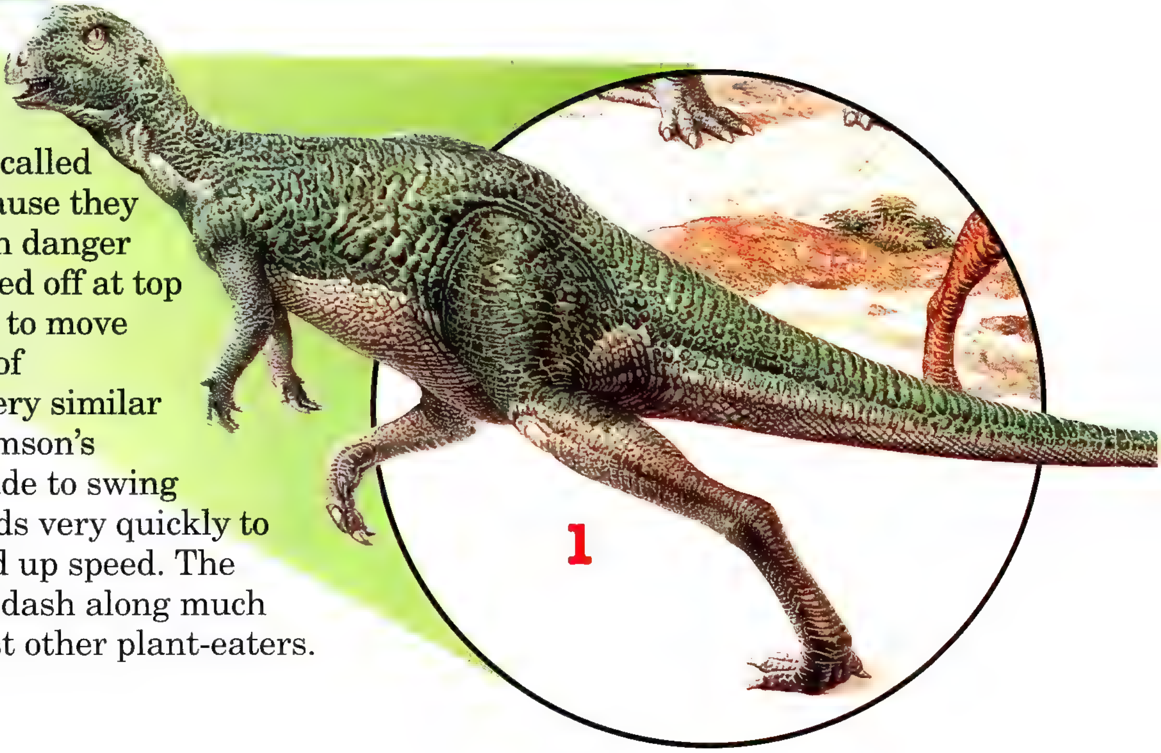
Dryosaurus was one of the earliest hypsilophodonts. It spread all over the world. Fossil remains have been found as far afield as North America and East Africa. *Hypsilophodon* appeared in the Early Cretaceous Period, almost 120 million years later. All the skeletons found so far have come from the Isle of Wight. *Tenontosaurus* arrived a few million years later and died out about 108 million years ago. It was discovered in North America.

FAMILY LIKENESS

Hypsilophodonts changed very little in appearance over a period of 100 million years. *Hypsilophodon* looked very much the same as *Thescelosaurus,* although there were, in fact, 40 million years between them. *Dryosaurus* and *Thescelosaurus* both looked like small iguanodonts. Scientists think that because of the close resemblance, iguanodonts and duckbilled dinosaurs may have evolved from the family of hypsilophodonts.

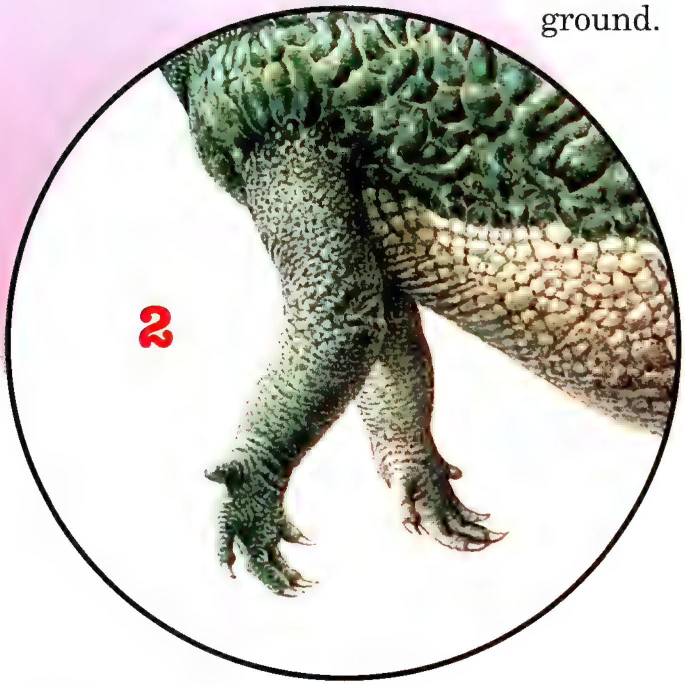
1 FLAT OUT

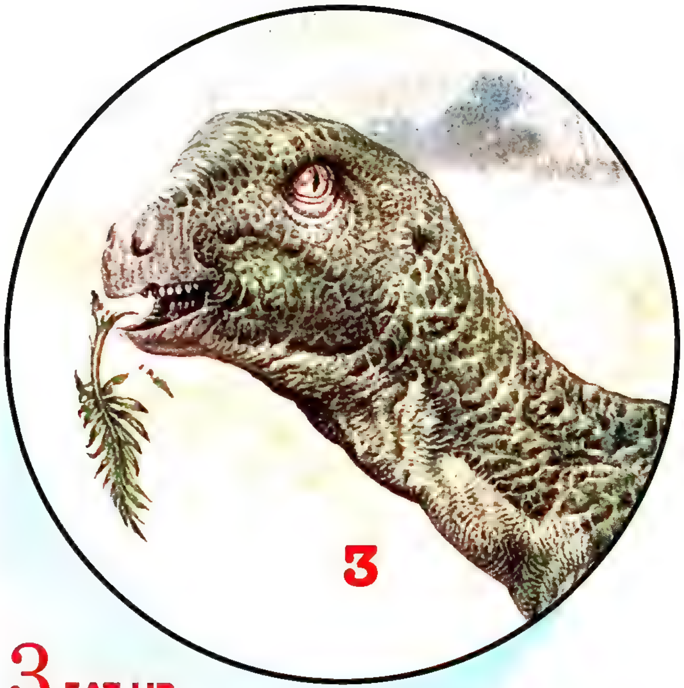
Hypsilophodonts were called 'dinosaur gazelles' because they could run so fast. When danger threatened they sprinted off at top speed. They were built to move quickly. The hind legs of *Hypsilophodon* were very similar to those of today's Thomson's Gazelle. They were made to swing backwards and forwards very quickly to help the dinosaur build up speed. The hypsilophodonts could dash along much more quickly than most other plant-eaters.



2 OUT OF ITS TREE

Early experts believed *Hypsilophodon* lived in trees because it had long fingers and toes. For almost 100 years, artists drew the dinosaur perched like a bird on a branch. It was not until 1974 that Professor Peter Gallow changed their minds. He proved that there was no evidence to show that *Hypsilophodon* was a tree dweller. In fact it was well adapted to live on the ground.





3 EAT UP

The hypsilophodonts were more efficient eaters than many earlier dinosaurs. And that was why the family survived for so long. *Hypsilophodon*, or 'high ridge tooth', was named because of its cheek teeth. When it ate, the upper and lower teeth locked together to form a flat surface for chewing its food. It also had powerful jaws to help it cope with tough plants.

4 TOOTH TRUTH

Tenontosaurus might have looked more like a small *Iguanodon*. But the way its teeth were arranged showed it was really a hypsilophodont. This dinosaur had a long, deep head to allow it to take in lots of food. There was also plenty of room for its huge, powerful jaw muscles.

ALL FOURS

Tenontosaurus was much bigger than most hypsilophodonts. It weighed up to one tonne and had an enormous tail. The dinosaur also had longer, thicker arms than other members of the family. Because of these differences, it probably moved in a different way. *Tenontosaurus* ran along on its hind legs like other hypsilophodonts, but it might have walked on all four legs.

SUCKED UNDER

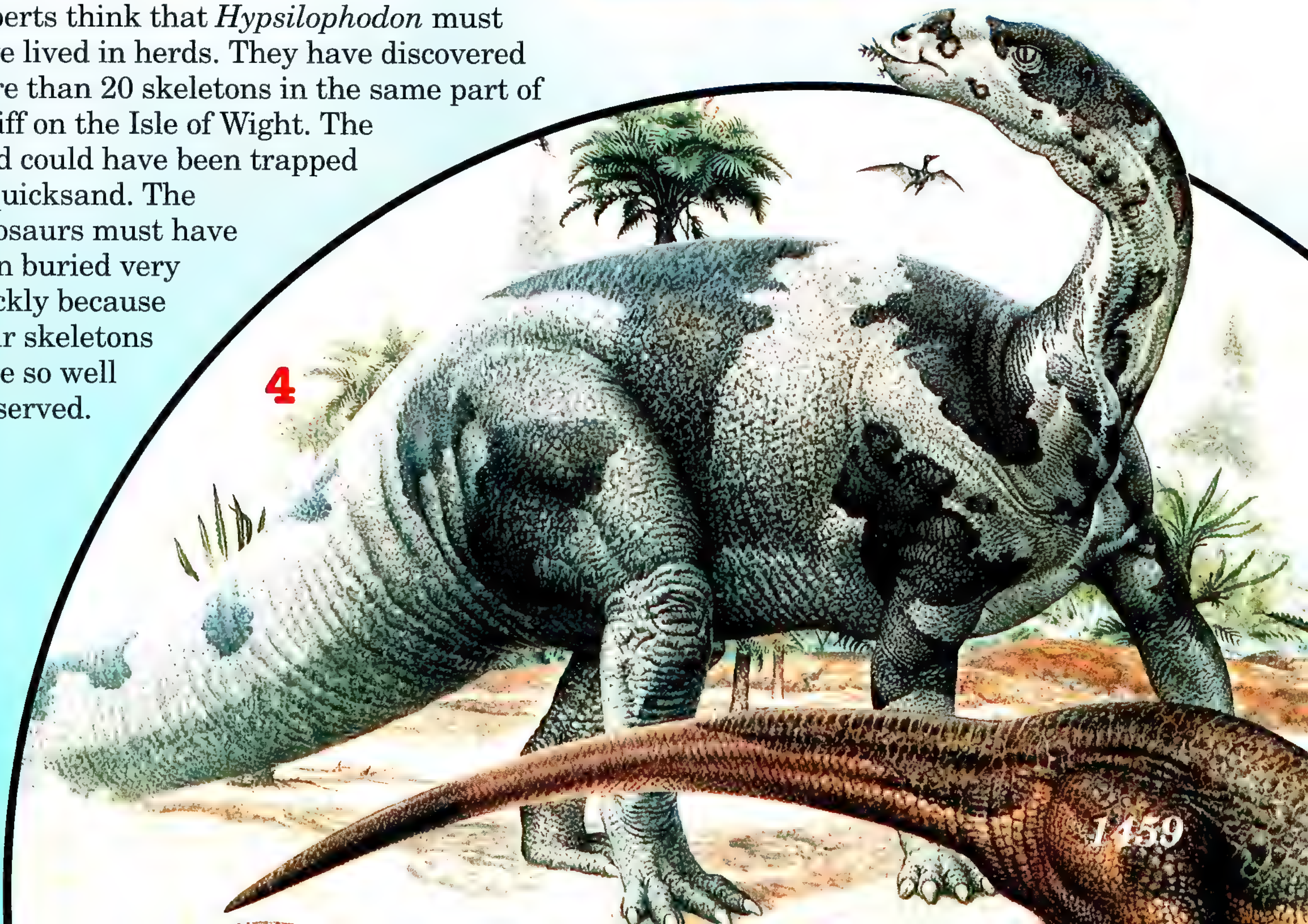
Experts think that *Hypsilophodon* must have lived in herds. They have discovered more than 20 skeletons in the same part of a cliff on the Isle of Wight. The herd could have been trapped in quicksand. The dinosaurs must have been buried very quickly because their skeletons were so well preserved.

Is it true that a skeleton of *Tenontosaurus* was found surrounded by other dinosaur skeletons?

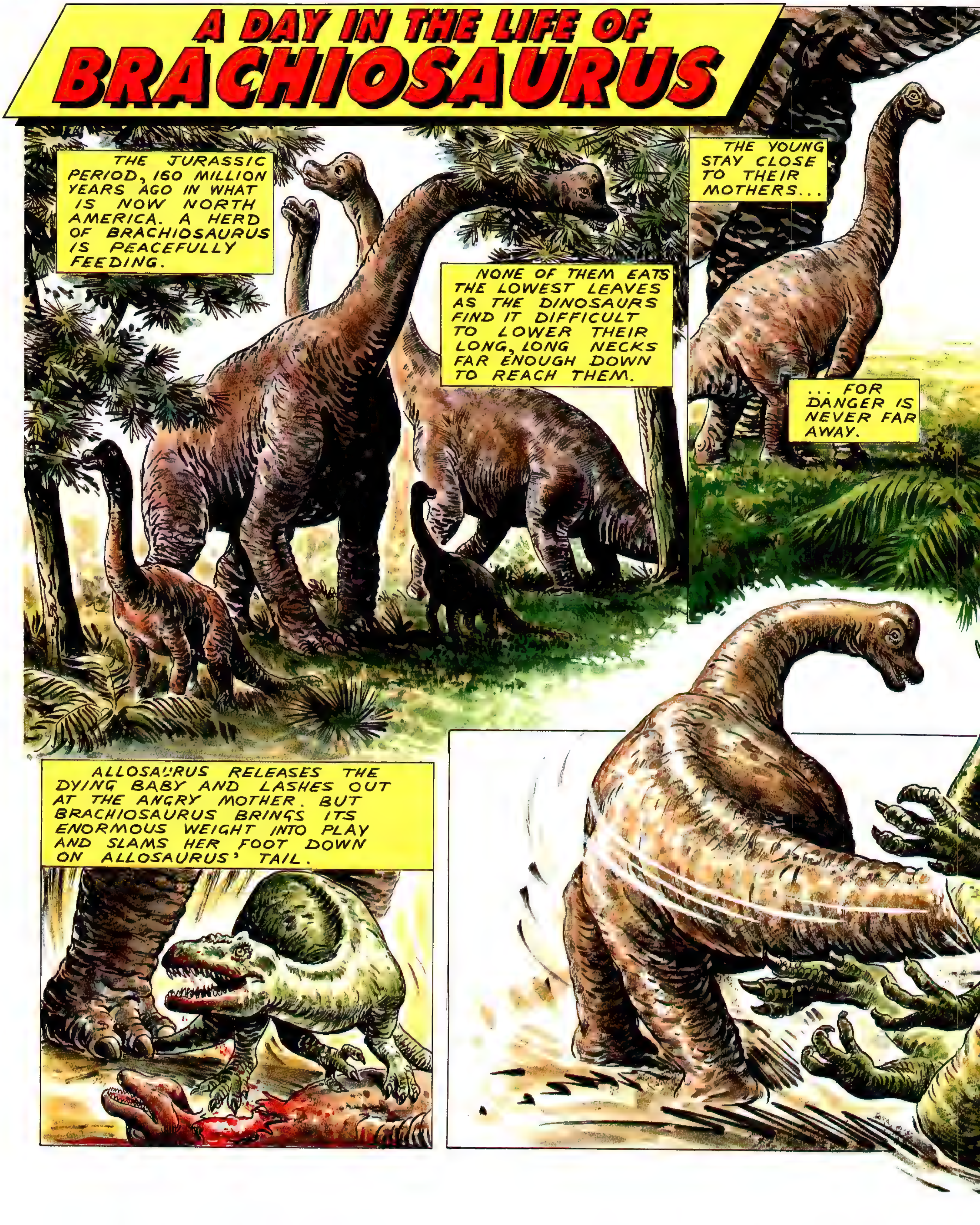
Yes. Experts made a remarkable discovery in Montana, USA. They found a *Tenontosaurus* skeleton that was surrounded by the skeletons of five *Deinonychus*. These meat-eating dinosaurs were ferocious hunters with blade-like teeth and clawed toes. We do not know what really happened, but perhaps the *Deinonychus* attacked *Tenontosaurus* and were killed during the death struggles of the plant-eating giant.

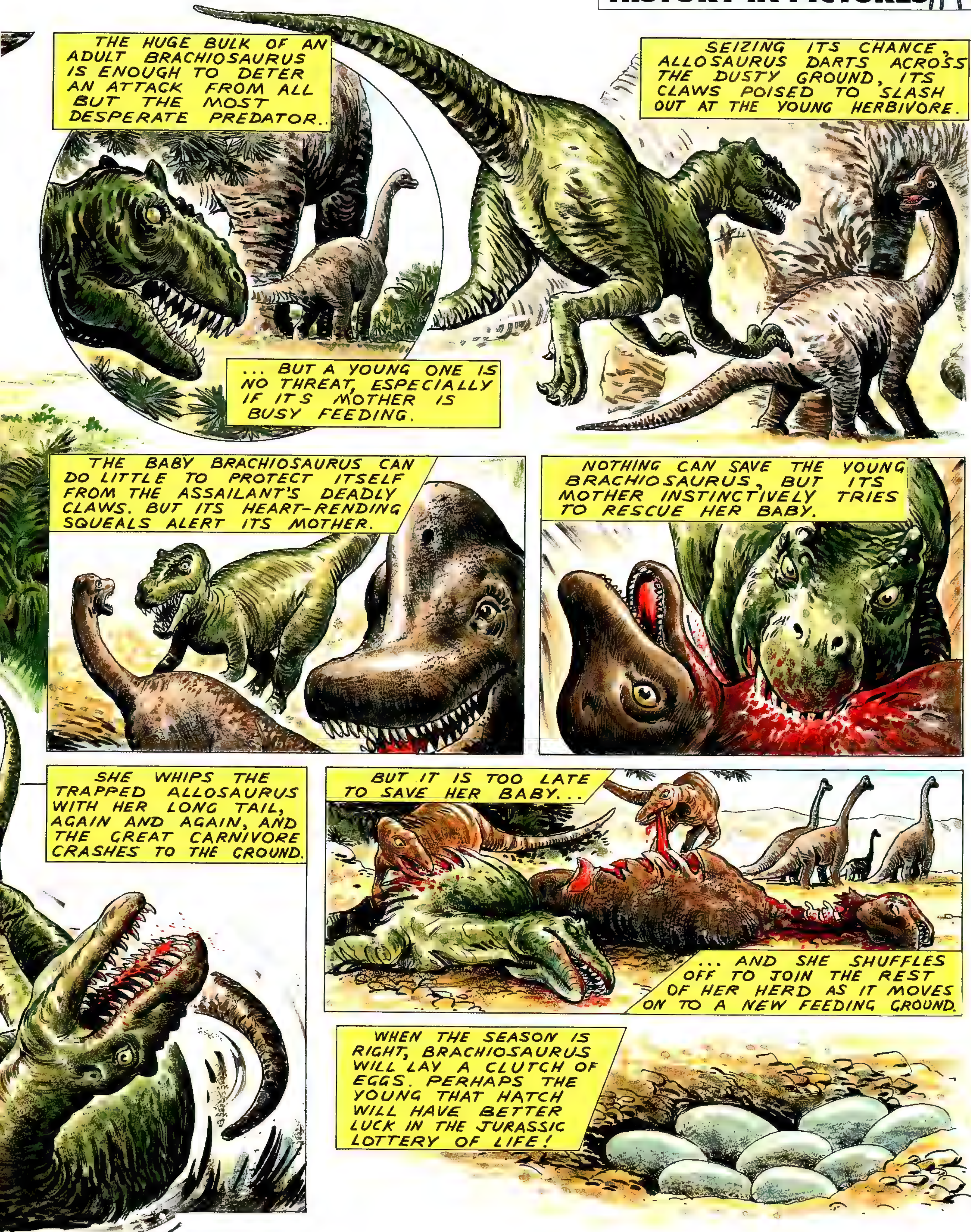
CHECK LIST

- FAST RUNNER
- POWERFUL HIND LEGS
- LONG, STIFF TAIL



A DAY IN THE LIFE OF BRACHIOSAURUS


THE JURASSIC PERIOD, 160 MILLION YEARS AGO IN WHAT IS NOW NORTH AMERICA. A HERD OF BRACHIOSAURUS IS PEACEFULLY FEEDING.
NONE OF THEM EATS THE LOWEST LEAVES AS THE DINOSAURS FIND IT DIFFICULT TO LOWER THEIR LONG, LONG NECKS FAR ENOUGH DOWN TO REACH THEM.
THE YOUNG STAY CLOSE TO THEIR MOTHERS...
... FOR DANGER IS NEVER FAR AWAY.
ALLOSAURUS RELEASES THE DYING BABY AND LASHES OUT AT THE ANGRY MOTHER. BUT BRACHIOSAURUS BRINGS ITS ENORMOUS WEIGHT INTO PLAY AND SLAMS HER FOOT DOWN ON ALLOSAURUS' TAIL.


THE HUGE BULK OF AN ADULT BRACHIOSAURUS IS ENOUGH TO DETER AN ATTACK FROM ALL BUT THE MOST DESPERATE PREDATOR..
... BUT A YOUNG ONE IS NO THREAT, ESPECIALLY IF IT'S MOTHER IS BUSY FEEDING.
SEIZING ITS CHANCE, ALLOSAURUS DARTS ACROSS THE DUSTY GROUND, ITS CLAWS POISED TO SLASH OUT AT THE YOUNG HERBIVORE.
THE BABY BRACHIOSAURUS CAN DO LITTLE TO PROTECT ITSELF FROM THE ASSAILANT'S DEADLY CLAWS. BUT ITS HEART-RENDING SQUEALS ALERT ITS MOTHER.
NOTHING CAN SAVE THE YOUNG BRACHIOSAURUS, BUT ITS MOTHER INSTINCTIVELY TRIES TO RESCUE HER BABY.
SHE WHIPS THE TRAPPED ALLOSAURUS WITH HER LONG TAIL, AGAIN AND AGAIN, AND THE GREAT CARNIVORE CRASHES TO THE GROUND.
BUT IT IS TOO LATE TO SAVE HER BABY...
... AND SHE SHUFFLES OFF TO JOIN THE REST OF HER HERD AS IT MOVES ON TO A NEW FEEDING GROUND.
WHEN THE SEASON IS RIGHT, BRACHIOSAURUS WILL LAY A CLUTCH OF EGGS. PERHAPS THE YOUNG THAT HATCH WILL HAVE BETTER LUCK IN THE JURASSIC LOTTERY OF LIFE!

Improve and test your knowledge with... FACT FILE

Fascinating facts to read and 10 fun questions to answer!

Cold feet

Iguanodon footprints have been found on rock surfaces in the cold wastes of Spitzbergen. The climate within the Arctic Circle must have been much less harsh in Cretaceous times.

1 Skeletons of *Deinonychus* were found surrounding:
a) *Tenontosaurus*
b) *Parksosaurus*
c) *Dravidosaurus*

2 *Nothosaurus* was:
a) a reptile
b) a dinosaur
c) a shark

3 Early experts believed that *Hypsilophodon*:
a) flew like a pterosaur
b) swam underwater
c) lived in trees

4 *Parksosaurus* is often compared to today's:
a) cheetah
b) gazelle
c) sprinter

5 *T Rex* caught its prey by:
a) lying in ambush
b) running after it
c) jumping out of trees

6 *Edaphosaurus* may have been able to:
a) swallow plants whole
b) eat fish
c) crunch up mollusc shells

7 Trilobites are probably all:
a) extinct
b) in hiding
c) on holiday

8 *Hyrachyus* was one of the first:
a) rhinos
b) tapirs
c) pigs

9 *Baryonyx* had jaws like a:
a) meat-eating lion
b) fish-eating crocodile
c) plant-eating sheep

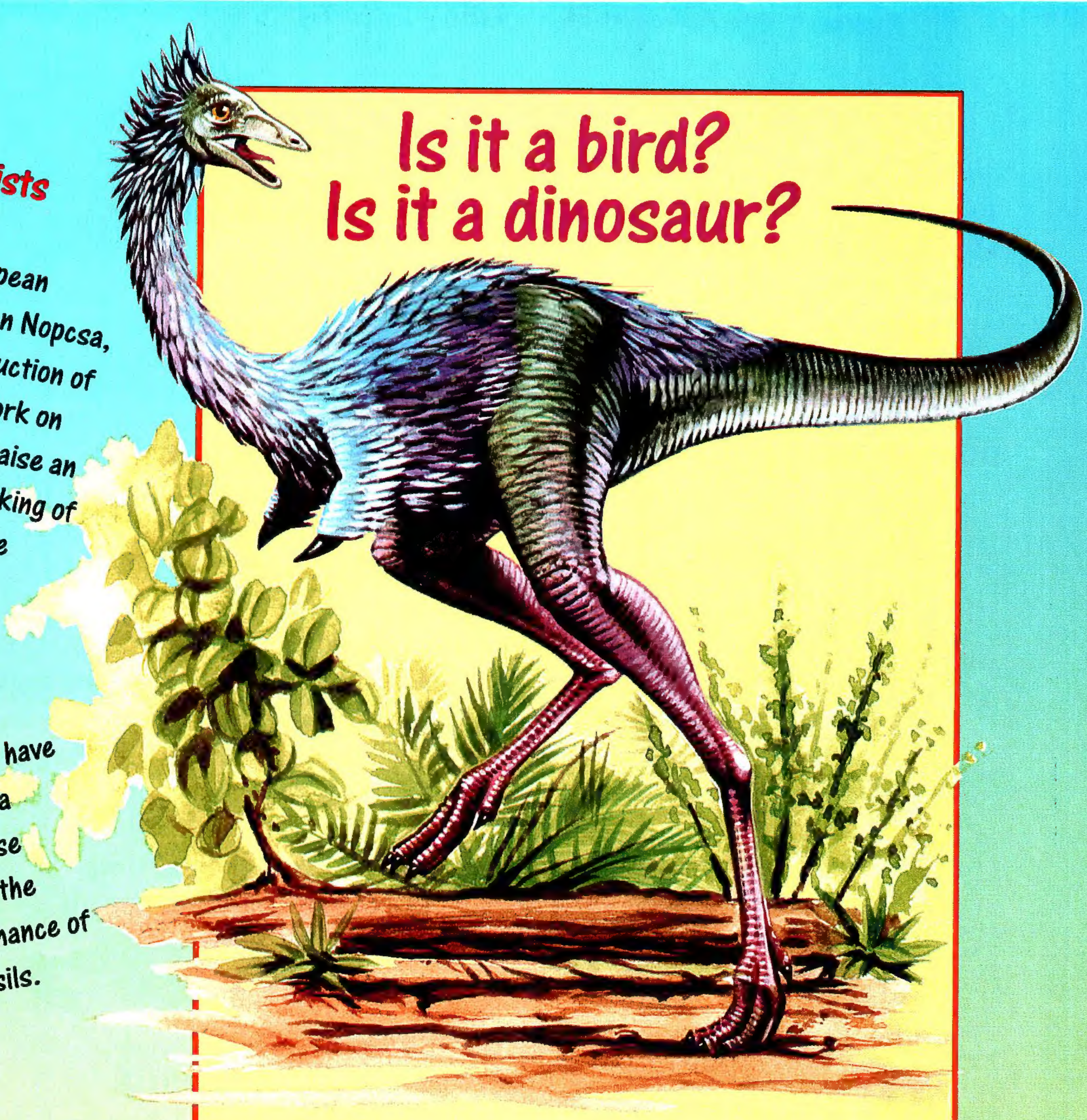
Palaeontologists rule OK?

The central European palaeontologist Franz von Nopcsa, famous for his reconstruction of Polacanthus and his work on Archaeopteryx, tried to raise an army and set himself up as king of Albania just before the First World War.

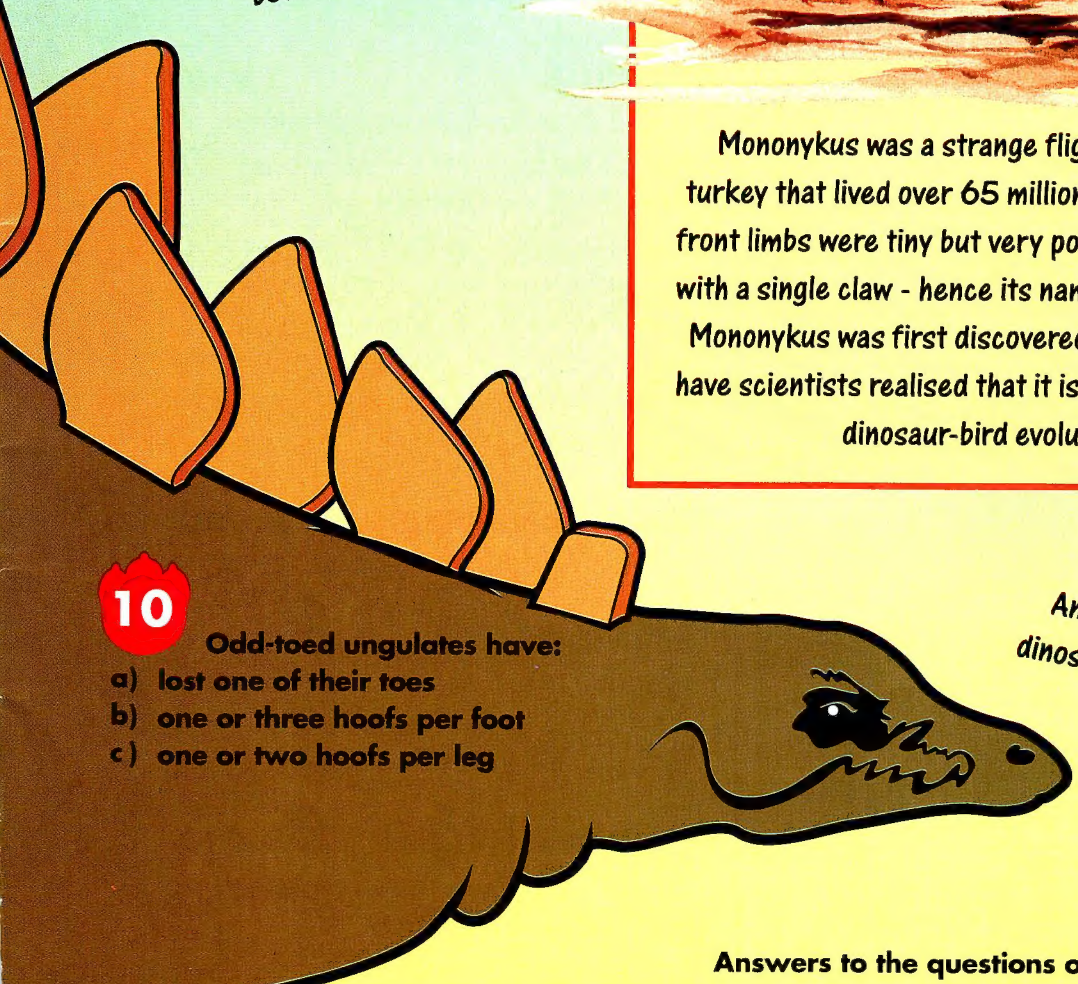
Bird bones

Most bird fossils that have been found are of sea birds. This is because animals that die in the sea have a better chance of becoming fossils.

Is it a bird? Is it a dinosaur?



Mononykus was a strange flightless bird the size of a turkey that lived over 65 million years ago in Mongolia. Its front limbs were tiny but very powerful and each was tipped with a single claw - hence its name which means 'one-claw'. Mononykus was first discovered in 1923 but only recently have scientists realised that it is another exciting link in the dinosaur-bird evolutionary chain.



10

Odd-toed ungulates have:

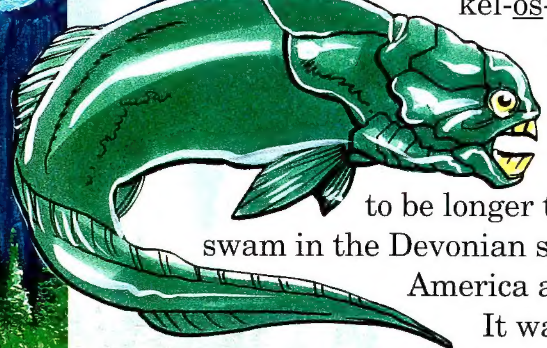
a) lost one of their toes
b) one or three hoofs per foot
c) one or two hoofs per leg

A chink in the armour

Ankylosaurus, the biggest armoured dinosaur we know, is only known from an incomplete skeleton.

Answers to the questions on inside back cover

DUNKLEOSTEUS **395 MYA**

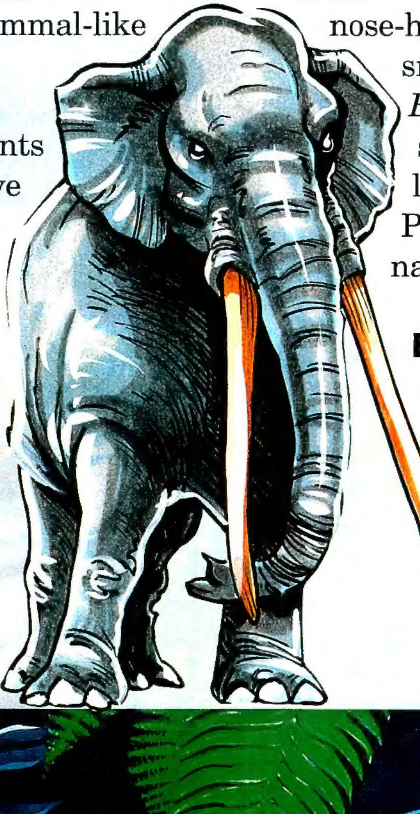


Massive *Dunkleosteus* (dun-kel-os-tee-us) was a fish with plated skin and gigantic jaws. It grew to be longer than a bus. It swam in the Devonian seas of North America and Europe. It was a fierce predator and scooped up fish in its gaping mouth as it swam. Its 'teeth' were blades of solid bone which fitted together like steel shutters.

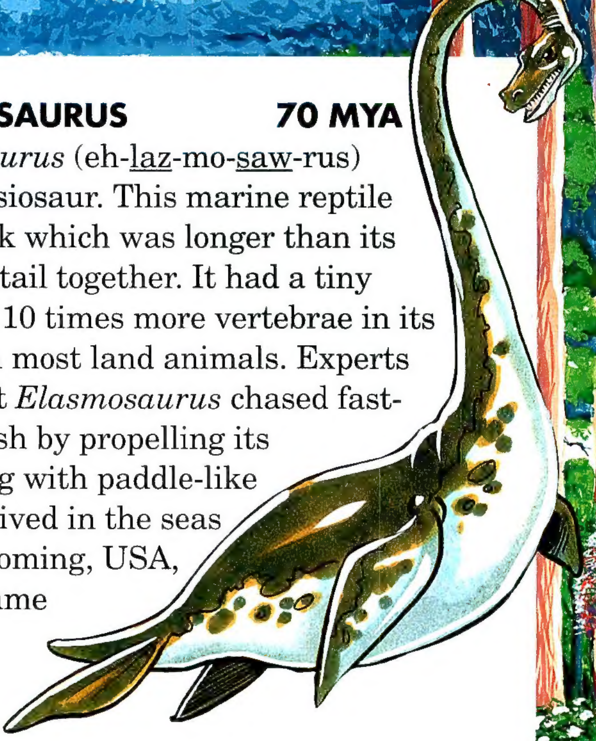
E

EDAPHOSAURUS **250 MYA**

Edaphosaurus (eh-daf-o-saw-rus) means 'earth reptile'. It was a mammal-like reptile that lived on the shoreline of swamps and lakes and fed on tough plants and ferns. It may even have been able to crunch mollusc shells with the blunt teeth in the roof of its mouth. *Edaphosaurus* was as long as today's rhinoceros and had a tall sail on its back, which probably helped to control its body temperature. *Edaphosaurus* lived in North America and in Germany.



ELASMOSAURUS **70 MYA**



Elasmosaurus (eh-laz-mo-saw-rus) was a plesiosaur. This marine reptile had a neck which was longer than its body and tail together. It had a tiny head and 10 times more vertebrae in its neck than most land animals. Experts think that *Elasmosaurus* chased fast-moving fish by propelling its body along with paddle-like limbs. It lived in the seas above Wyoming, USA, and its name means 'plate reptile'.

ELASMOTHERIUM **2 MYA**

Elephant-sized *Elasmotherium* (eh-laz-mo-thee-ri-um) was a rhinoceros with a huge nose-horn. It rose straight up from its snout to a height of 2m. *Elasmotherium* had a bulky body supported by four chunky legs. It lived in Europe and Asia in the Pleistocene Epoch and ate plants. Its name means 'plate beast'.

ELEPHAS ANTIQUUS **2 MYA**

Elephas antiquus (eh-laf-as an-tee-kus), an early elephant, survived until the end of the Ice Age. It was a huge beast, well over 3.7m tall, with big tusks and a flexible trunk. It grazed on plants.

MYA = MILLION YEARS AGO

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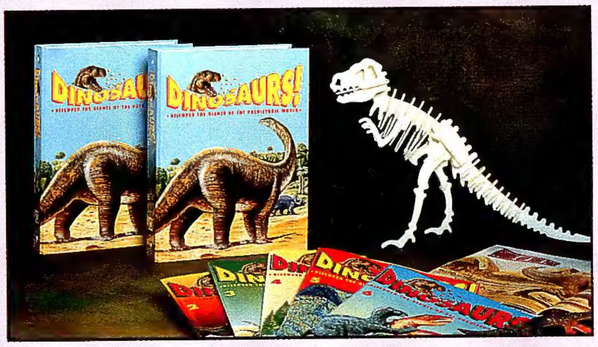

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PLUS

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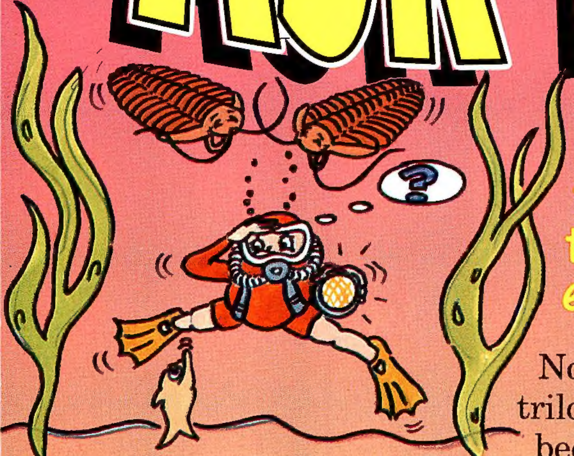
GIANTS OF THE PAST

PICTURE CREDITS: Front cover: Tim Hayward/Bernard Thornton Artists. Peter M Galton, University of Bridgeport 1442 T; Natural History Museum, London: IFC; Natural History Museum/M Long 1447 T, 1449 R; Natural History Museum/John Sibbick 1456, 1457, 1458, 1459; NHPA 1449 L, 1454 BL; ZEFA 1455 TR. **Artwork**: Black Hat 1464; Guy Callaby 1447 BR; Mike Dorey 1460/1, Wayne Ford/WLAA 1455 TL, 1477 TR, 1448 B, 1455 TL; Ryz Hajdul 1454/5; Tim Hayward/Bernard Thornton Artists 1441, 1442/3, 1450/1; Deidre McHale: back cover; Andie Peck/WLAA 1446; Graham Rosewarne 1444, 1445, Chris West/Black Hat 1463 TR; Steve White 1452/3

ANSWERS TO FACT FILE QUESTIONS: 1.a 2.a 3.c 4.b 5.a 6.c 7.a 8.a 9.b 10.b

Dr David Norman of Cambridge University answers your dinosaur questions

ASK THE EXPERT



Are all the trilobites extinct?

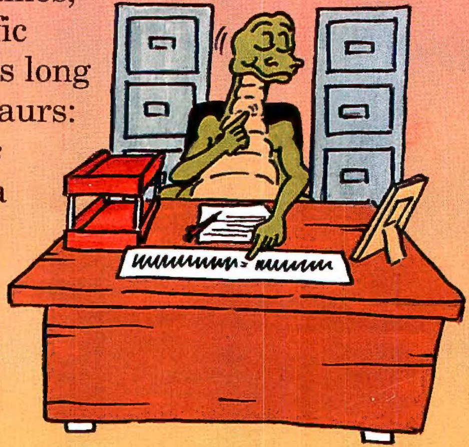
No trace of any trilobites has been found since the very rare ones of the Late Permian Period. Although we cannot say that every bit of the present sea bed has been scoured to prove that there are no living trilobites, the odds seem to be against there being any.

Did the duckbilled dinosaurs really have webbed fingers?

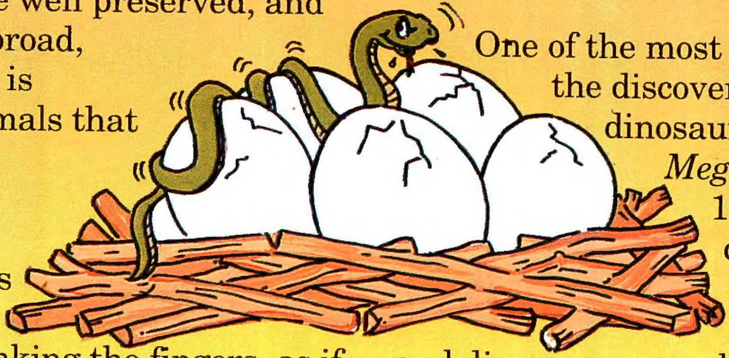
No, I do not think so. The four fingers of their hands are quite well preserved, and the first two end in broad, flattened hoofs. This is characteristic of animals that walk on firm ground rather than move by swimming. A few mummified skeletons from North America seem to show skin linking the fingers, as if they were webbed, but I think it is much more likely that this skin is the flattened toe pads. These have probably spread sideways as the animal was compressed and then fossilized.

Why do dinosaurs have such big names?

Mainly because we do not have a common name for dinosaurs. Most living animals have common names, but their scientific names are just as long as those of dinosaurs: a poodle is *Canis domesticus* and a human is *Homo sapiens*. So the real problem is that we have not given dinosaurs common names.



What is the most important dinosaur find ever?



One of the most important finds was the discovery of the earliest dinosaur – the bones of *Megalosaurus* – in about 1817. In the 1960s the discovery of *Deinonychus* made us realise that birds and dinosaurs are related, and the finding of dinosaur nests was important too. So, the choice is yours.

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